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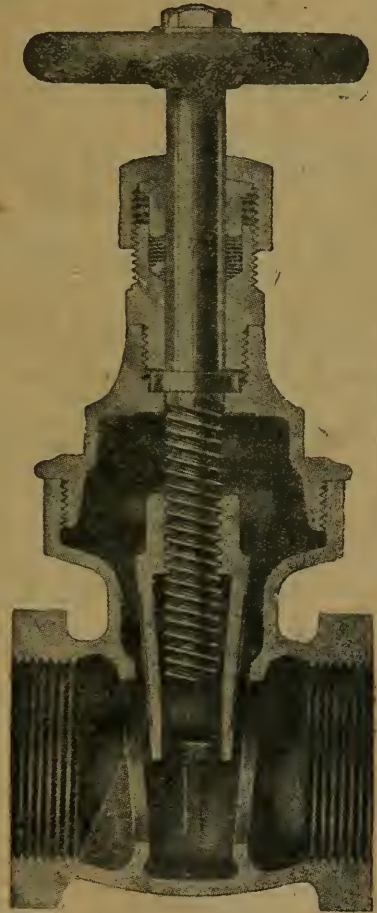
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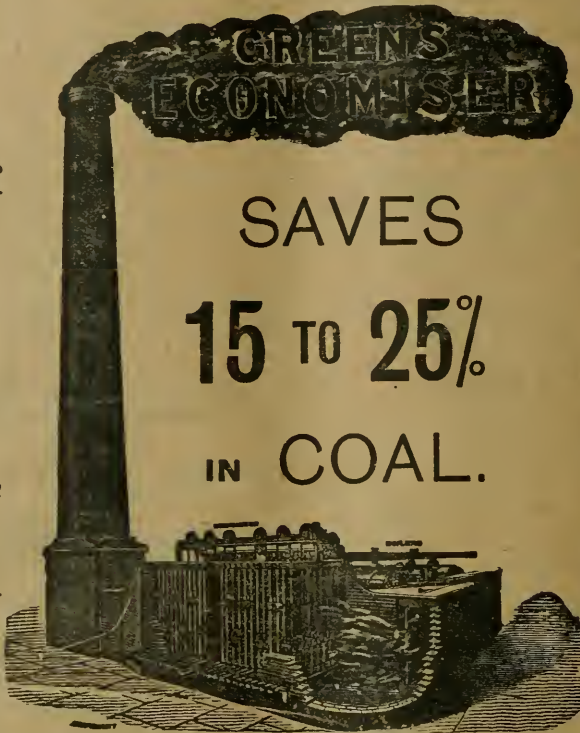
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South African Mines, Commerce and Industries.

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## CONTENTS.

	PAGE
Notes and News	47
Topics of the Week:	
The Position of the E.R.P.M.	49
State Aid to Mining	50
The Mines and the Transvaal Liquor Law	51
The Nigel: Manager's Annual Report	53
The April Gold Output in Detail	55
Progress on Goerz Mines	57
Latest Results from the General Mining Group	59
Tungsten Ores in Southern Rhodesia	61
The Week in the Sharemarket	63
The Week in the Mining Material and Engineering Trades	65
Rating of Site Values	68
Engineering Notes and News:	
S.A. Institute of Electrical Engineers: President's Address—VII.	69

## Notes and News.

The report of the directors of the East Rand Proprietary Mines, Ltd., for the quarter ending 31st March, 1918, shows that development work was as follows:—Total footage, 6,503 feet; total footage sampled on reef, 3,223 feet. The payable reef disclosures were as follows: Main Reef, 70 feet, width 30 inches, assay value 8.2 dwts.; Main Reef Leader, 929 feet, width 21 inches, assay value 19.9 dwts.; Composite Reef, 430 feet, width 35 inches, assay value 14.9 dwts. Reduction works: Ore received from mine, 394,444 tons; ore received from surface dumps, 7,350 tons; total, 401,794 tons; waste sorted out, 9.3 per cent.; tonnage crushed, 366,800 tons; number of stamps operating, 600 stamps; number of tube mills operating, 23 tube mills. Value of ore before crushing (reflected by mill yield and value of pulp): Mill yield per ton, 3.093 dwts.; assay value of pulp, 2.957 dwts.; total, 6.050 dwts.; total yield, 101,720 fine ozs.; total yield per ton, 5.546 dwts. It will be seen that the profits for the quarter are £17,713 below the quarterly sum of £33,000 required to meet the standing charges, consisting of redemption of debentures, debenture interest, miners' phthisis compensation, undermining rights annuity, Government taxes, etc. The hope previously expressed to the effect that the profits would be sufficient to meet fixed charges has not been realised, and in view of the consistently low grade ore exposed by development in the lower levels of the mine, with no indication of improvement, and after consideration of the financial requirements involved in the southern development scheme, and in view of the financial position of the company, the board of directors has resolved that milling operations be continued as long as reasonably possible and that the southern development scheme be abandoned at 31st May, 1918. The whole position will be fully dealt with by the chairman at the annual meeting, to be held on 29th May. The amount expended on the southern development scheme, namely, the 26th level cross-cut and the new vertical shaft, has amounted to £12,034 for the quarter, this being provided out of the mine development suspense account, which now shows a credit of £310,819.

The next ordinary general meeting of the Chemical, Metallurgical and Mining Society of South Africa will be held in the Lecture Theatre, C. M. & M. Society, South African School of Mines and Technology, Johannesburg, to-day (Saturday, 18th) at 7.45 p.m. General business: "The Furnace as an adjunct to the Smithy on a Gold Mine," by Mr. R. Craib. Continued discussion on "Mercury," and "Assay Supplies, and the utilization of S.A. materials in assay offices." Paper for reading: "The Cementation Process applied to Mining (Francois system)," by Mr. A. H. Krynauw (member). The paper will be illustrated by a number of lantern slides. Replies to discussion: (a) "Electric Furnace Manufacture of Shoes and Dies on the Witwatersrand," by Prof. G. H. Stanley, and (b) "Electric Steel-Melting Plant," by Prof. W. Buchanan. Final discussion: (1) "Fertilizers," by Mr. Allan Baguley, B.Sc., F.I.C.; (2) "A New Method of Determining Copper," by Dr. James Moir. Continued discussion: (1) "The Manufacture of Crude Sodium Manganate for use on the Mines," by Mr. F. Wartenweiler; (2) "Notes on an Underground Spring of Water containing Manganese and Lithium," by Mr. John Watson, F.I.C.; (3) "The Estimation of Injurious Dust in Mine Air by the Kotzé Konimeter," by Mr. John Innes; (4) "Further Notes on Sand Filling of Mines," by Mr. C. H. Greathead.

In the Rhodesian Legislative Council last week Mr. Newton (Treasurer), in the course of his Budget speech, stated that the gross export from Rhodesia last year amounted to £5,473,000, as against imports £2,515,000, a big balance in our favour of £2,958,000. South African produce



imports amounted to £655,000, an increase of £62,000 over the previous year. In a great measure this was due to freight difficulties and increased activities in South African industries. He mentioned that our stock-in-trade in cattle was 582,000 European owned, an increase of 13½ per cent., and 552,000 native owned, an increase of 12 per cent. Last year we sent to Johannesburg 13,220 head, valued at £136,000, and export trade had also been opened with East Africa. Last year's crop of maize was 938,000 bags, a Southern Rhodesian record, and 416,000 bags were exported. Minerals exported, gold, chrome ore, blister, copper, asbestos, coal, coke, diamonds, etc., amounted to £4,543,000; pastoral exports were £253,000, and agriculture £328,000. The actual revenue last year was £786,328, and expenditure £744,740. The deficit was £43,889, against an estimated deficit of £79,000. The estimated expenditure for the current year was £985,194, and revenue £892,000. The latter was due chiefly to the falling-off in Customs revenue. The estimated deficit was £143,194. The Treasurer outlined new taxation proposals, namely, income tax or excess profits tax, whichever was the greater. Income tax would be payable on so much income as exceeded £1,600, except in the case of bachelors, who would pay on income above £500. The rate proposed was 1s. in the £, and the rate of excess profits tax was 40 per cent. on profits over £1,000. It is estimated £55,000 will be collected from the new taxation. He indicated the introduction of a compulsory scheme of local defence in urban areas, and an Augmentation of Pensions Ordinance to bring pensions up to Union level.

\* \* \* \*

The Government labour report for April shows the following applications for employment during the

**The White Labour Position.** month: Johannesburg, 482 against 555 in the previous month; Pretoria, 177 against 205; Capetown, 200 against 195; Durban, 92 against 90; Bloemfontein, 58 against 67; total, 1,004 against 1,112. Employment was found for 209 against 196, 52 against 68, 82 against 82, 48 against 65, and 17 against 26; total 408, compared with 435 in March. Johannesburg reports: The total number of applications for employment registered in this department during the month of April, 1918, amounted to—men's section, 255; juvenile section, 118; women's section, 109; total, 482. The total number for whom employment was found is as follows: Men's section, 72; juvenile section, 54; women's section, 83; total, 209. In addition, 46 juveniles were dealt with, 18 being found employment and the rest returned to schools and training establishments. The estimated value of plans passed by the seven principal municipalities amounted to £98,808, as compared with £92,454 for the previous month, showing an increase of £1,354. Tenders accepted by the Government amounted to £59,053 as against £79,067, showing a decrease of £20,414. The Johannesburg report proceeds: Mining continues active in spite of the ever-increasing difficulties regarding stores. There is a slight increase in the number of men seeking employment on the mines, but very few skilled miners are out of work. All sections of the engineering trades are well employed. Several fitters are out of employment in the central district; turners and moulders are in demand, and electrical engineering is fairly busy in the general electrical work. Very little doing in the house wiring line. In the building trades, carpenters are fairly busy, bricklayers moderate, plasterers moderate, masons moderate, painters fairly well employed, plumbers very busy. The prospects in the building trades generally are fairly good, and work which has been retarded for one reason or other is now being pushed on. There has been a decided drop in the demand for printers during the month, and several men are out of employment; bookbinding is rather slack with a few men out of work, which is common at this period of the year. Tailoring, shirtmaking and hat and cap making, cabinetmaking and bootmaking are reported fair to very busy. The nut and bolt factory is running double shift, and a start has been made by a local firm to produce a new disinfectant, the same company also manufactures for sale the plant necessary for producing the disinfectant.

For the fourteen months ended December 31 last the report of the H.E. Proprietary (New) states that the profit and loss account, after allowing for outgoings, shows a surplus of £10,231, which the directors propose should be transferred to a general reserve account. Satisfactory dividends have been received from the interest held by the H.E. Proprietary (New), Ltd., which is approximately three-eighths of the share capital of the hotel company, and also in respect of the holding of debentures. St. James' Court, Ltd., has benefited by the great demand for service flats in London. The entire share capital of St. James' Court, Ltd., is owned by the H.E. Proprietary (New), Ltd. Under the auspices of important ironmasters in the north, the undertakings formerly owned by the Channel Collieries Trust, Ltd., and the Kent Collieries, Ltd., have been consolidated under the style of Channel Steel Co., Ltd. The interest of the H.E. Proprietary (New), Ltd., which formerly was in Channel Collieries Trust shares, is now represented by the preferred ordinary and deferred ordinary shares of the Channel Steel Co., Ltd. As to New Lisbon Berlyn, Ltd., further tests have taken place during the year for the purpose of turning to account the sulphur contents of the pyritic ore, with a view to meeting the growing demand which exists in South Africa in connection with the production of sulphuric acid. Regarding claim interests in the Northern Transvaal, the outlying claims on the Murchison range have been relinquished during the year, the directors being of opinion that the interest held by this company in the Free State mine and in adjoining claims should enable it to command the position in the event of any fresh discoveries being made. The company's interest in the Palabora Copper Field has been fully maintained. A contract was entered into for the sale of certain claims in the Nigel district (Far Eastern Rand), in which this company had an interest, to the Sub Nigel, Ltd., for shares in that company. This transaction has been completed during the period under review, and in place of the claim interest this company is now interested as a holder of Sub Nigel shares from which a satisfactory dividend is being received. Respecting Klippoortje No. 228, the directors have entered into a provisional contract with the firm of Hamilton, Ehrlich and Turk for the purchase from them of the farm Klippoortje No. 228 (northern portion), Heidelberg district. The vendors are interested in this company as the largest shareholders and as directors and managers. The property is a freehold, covering 1,531 morgen 336 square rods, equal to 3,241 English acres. It is situated to the south-west of the Sub Nigel mine, being separated therefrom by the farm Maraisdrift, owned by the Rhodesian Exploration Co., Ltd. The railway from the Rand to Natal passes through Klippoortje, and the main station of the Nigel mining district is on the property. The directors are advised that the whole of the property is traversed by the main (Van Ryn-Modderfontein) reef series at an easily workable depth. The purchase price has been agreed as 200,000 shares of the nominal value of 10s. each, to be allotted to the vendors out of the unissued shares of the company. The vendors undertake not to apply for a special settlement in these shares until six months after the date of signature of the final treaty of peace, or, alternatively, a period of two years from the date of allotment. The provisional contract is subject to confirmation by shareholders. The directors state they feel that the ownership of this property will give the company an important interest in the development of the Far Eastern Rand. It is proposed to co-operate with the owners of the adjoining property in a comprehensive scheme of boring, with a view to flotation as a separate company. It is noteworthy that the farm Maraisdrift, immediately to the north, is owned as to two-thirds by the Rhodesia Exploration, and as to one-third by Sir Abe Bailey. Mr. F. H. Hamilton is a director of the H.E. Proprietary, and has close relations with the Rhodesia Exploration Company.



The Namaqua Copper Company, Ltd., announces that all shipments of copper concentrates from South Africa having been stopped by the Ministry of Shipping, the board have reluctantly found it necessary to temporarily suspend operations at the mines. The annual general meeting is expected to be held some time this month, when full details will be laid before shareholders. A full report of the Messina meeting appeared in our last issue.

\* \* \*

It will be remembered that the question of paper currency and the desirability of uniformity in note issues was discussed at the second Bank Notes for Natives. Rhodesian Mining Conference in regard to the payment of native wages in paper instead of coin, and representations on the subject were made to the local banks. It would appear, says the Executive of the Chamber of Mines in their monthly report, that the suggestion made, that the Banks should co-operate in issuing notes of any one value in the same size, shape, and colour, irrespective of the bank of issue, is quite impracticable under present conditions, as great difficulty is being experienced in obtaining note forms required to enable the banks to meet present urgent demands throughout the country, owing to delay in fresh supplies coming forward.

\* \* \*

The final report of Lord Balfour of Burleigh's committee on commercial and industrial policy after the war says in view of the shortage of world tonnage any policy tending to check the use of the ports by foreign shipping would not be expedient, although it might be desirable to impose restrictions on enemy shipping for a time. The committee do not think any attempt to make the Empire self-supporting in respect of all raw materials either practicable or sound on economic grounds, but that a selective policy is necessary, with due regard to probable military needs. The committee deem it unwise to aim at the exclusion of foreign (other than present enemy) capital from sharing in the development of the British Empire. It recommends legislation compelling the disclosure of foreign interests in particular cases, and that mineral and other properties be not secured by foreign concerns in order to prevent their development and check competition in supply, and that Dominion and Colonial Governments have measures of control over the working of properties where commodities of great Imperial importance are concerned. The committee recommends the adoption of a uniform policy by the Governments concerned, and does not recommend special restrictions on the participation of aliens in commercial and industrial pursuits, but affirms that pilots and patent agents should be British born, and that the question of registration of foreign commercial travellers should be considered. Alien enemies should be temporarily subject to police regulations after the war. The committee is opposed to the establishment of an Imperial bank of industry, but suggests Government action to safeguard the development of pivotal industries. The future economic policy should include a serious attempt to meet the declared wishes of the Dominions, Colonies and India for the readjustment and development of their economic relations with the United Kingdom, also an effort to develop trade between the Empire and the Allies. Subject to the Allies agreeing, the present enemy countries shall not, at least temporarily, be allowed to trade with the Empire without restrictions as before the war, or on equal terms to the Allies and neutrals. The committee recommends action similar to Canada against the dumping of goods. Preferential treatment should, it says, be accorded the overseas Empire in respect of Customs dues now or hereafter imposed in the United Kingdom. Other forms of Imperial preference should be considered. Protection should be afforded a certain number of industries on the recommendation of a strong independent Board. The committee opposes the metric and decimal coinage systems, and recommends the prohibition of the importation of enemy goods for at least a year after the war.

## TOPICS OF THE WEEK.

### THE POSITION OF THE E.R.P.M.

THE fact that the southern development scheme of the East Rand Proprietary Mines is to be abandoned at the end of this month furnishes a sharp reminder that the question of the low-grade mines remains unsettled. The position of the E.R.P.M. has from time to time been very fully explained in the reports issued by the directors, and, in giving evidence before the Select Committee on the gold mining industry at Capetown a few months ago, Mr. Wallers added a very frank recital of its unfortunate history. *Inter alia*, he said: "The East Rand Proprietary Mines is part of our group. We had nothing to do with the flotation of this mine. I am aware that there has been a loss of £12,000,000 in connection with this mine, but it has not fallen entirely on this country. There were a good many holders of shares in this country, but the proportion of East Rand shares held here was comparatively small compared with those held in Europe. The loss is a very serious one. I am not asking you to prop up the E.R.P.M. As a matter of fact, the East Rand cannot be propped up either by the Government or by anybody else. I have already explained that it would be impossible voluntarily to close down the E.R.P.M., because of the water conditions and the general outlook. We have money in hand conserved for the purpose of development, and we must go on as long as possible. We have in hand a sum of money for developing the southern area, and are proceeding on a restricted scale. If it were not for increased war costs we should have achieved the object of testing whether the southern area had a mine or not. I am afraid under existing conditions, however, we may not attain our object, but we must go on as long as possible. It is a question for the board to decide whether we go on or not. The E.R.P.M. has been a frightful disappointment to everybody. The gentlemen in London could not possibly know as much of the affairs of the E.R.P.M. as the men in this country. The E.R.P.M. has only been in our group since the death of Sir George Farrar. The reason for the loss is that values in depth for the last five years have completely fallen away. I do not think the individuals who made speeches knew anything of that before they made optimistic statements. The position of the E.R.P.M. since we took it over has been extremely disappointing. I am not responsible for those speeches, and I think that they were made in all good faith. At that time the mine was looking extremely well and the people who made speeches—if they did make them—attempted to prophesy, and said what they said in perfect good faith. Then the development in depth became worse and worse and at last became appalling. There is no value in the depth. The disappointments were impossible to guard against. The losses in connection with the E.R.P.M. were felt by everybody, not the least by the board and the members of the company." In another part of his evidence Mr. Wallers said: "My idea is to give assistance to the six mines that are voluntarily closed down in the form of a grant to be taken from a fund raised by the methods suggested in the memorandum which I handed in. The East Rand Proprietary Mines would I think be one of the last chosen by the Mining Engineer for this reason, that if that mine closed down it would never re-open. It makes 4,000,000 gallons of water in a day, which means that if it closed down the Wit. Deep next door on the west will fill up first and Knights Deep would also fill with water. I cannot say whether the E.R.P.M. will continue to pay its way for another twelve months. The East Rand Proprietary Mines have a certain amount of money in hand conserved for the purpose of developing the southern area. It must go on as long as it can for once it closed down the water troubles and so on would prevent it opening again. The cost of pumping alone at present is about £10,000 per month. The ultimate decision as to the future of the mine would of course depend on the debenture holders. The debenture debt at the present time is £1,000,000 and was originally £1,500,000." We are promised a full statement from the Chair at the annual meeting on May 29, but in the meantime the foregoing sufficiently indicates the seriousness of the position.

## STATE AID TO MINING.

### Detailed Review by the Secretary for Mines of Work Done and Contemplated.

In giving evidence before the Select Committee on Public Accounts, the Secretary for Mines, Mr. H. Warrington Smyth, made the following replies to questions regarding State-aid to mining:—Why should assistance be given to outside concerns for district mining development?—This matter was referred to by the Committee last year and also on previous occasions. I have with me the gold law of the Transvaal, and I will read Section 129, which is the section we act under. It reads: (1) The Minister may, out of moneys appropriated by Parliament for the purpose, assist the prospecting for and exploitation of precious or base metals (a) by erecting batteries, smelting works, ore dressing works, assaying and analytical laboratories, power stations, and pumping stations; (b) by the construction of roads, pipe lines, power lines, and water-courses; (c) by sinking of bore-holes; (d) generally in any other manner prescribed by regulation he may deem expedient; and may charge fees for the use of anything so erected, constructed or sunk, and do all acts and things and enter into all contracts necessary for the purposes of this section. (2) The Minister may, so far as he deems expedient, permit any officer of the Mines Department to advise any prospector or holder of mining title on any matter which relates to prospecting or mining for precious or base metals. It was following on the provision of that section that the policy was adopted, which has been much discussed from time to time, of assisting mining development in the outside districts where there are difficulties to overcome as, for instance, assisting them in metallurgical experiments, such as the one referred to in the papers on the Murchison Range. We helped the Union Jack Company to get to the bottom of a metallurgical problem—or again in overcoming difficulties by road-making. As far as possible the policy of the Government throughout in this direction has been to assist in reducing the cost of transport by mending roads, improving drifts, and so on. The result of building a road for a mine is not only to benefit the individual mine but also to benefit the farmers and people who are riding transport to that mine; people who form the local market for the mine's supplies. As a rule these roads are an asset to the district and although it seems out of the way to build roads in the remoter districts, at the same time there is no doubt of the great benefit conferred on the small mines in those districts. In certain cases we have also built roads, where we have been asked for assistance, in the Cape and Free State, especially at some of the salt pans, and also in Natal. But under the section of the Act above quoted more money has been spent in the metalliferous areas of the Transvaal than other parts of the country, and the demand has been greater there.

Do you do this also in Natal or in the Free State?—Yes; but I do not think we have done much in those Provinces the last few years. In a certain case in the Free State we advanced moneys to the local authorities; we contributed so much in their areas to assist in getting transport for a class of people who were poverty stricken and were dependent on the working of a salt pan to which the roads were in a very bad state indeed.

Mr. C. G. Fichardt: The point in regard to these roads is that they are made at considerable expense and they are just left as far as their maintenance is concerned?—That problem always presents itself, but we generally come in again later on with repairs. For example, a drift becomes impassable through washouts and we have naturally to come in and repair it.

It is not a bit of good making a road unless you maintain it?—I agree.

Chairman: Does not that show that the system is very unsound?—It is inevitable that as soon as the road gets into a bad state we again go to work on it. The districts referred to benefit a lot by these roads. Take the Asbestos Mine at Pengwe which is going to be a big thing with discoveries of

asbestos of good quality and excellent length of fibre along 40 miles of country; estimate the value a road will be to that concern and to the whole surrounding country and to the railway which it feeds. The local authorities of the Transvaal are full up with work, making roads where there is public traffic.

Mr. Merriman: Who is the local authority?—The Provincial Administration. Their hands are full up with the making of public roads where the ordinary traffic runs. This is a road going out to the wilderness, a place full of fever, and natives flocking along that road to work there. The whole traffic is mineral and stores traffic with a view to getting the asbestos to the market. We must do something to help, because the mine is not an over-capitalised venture. It has been worked up with the keenness and energy of one man.

Who is the man?—Mr. Wayne.

Chairman: Who will see to the maintenance of the road?—We must see to it for the next few years, but other questions may arise later on. There may be a narrow gauge railway laid down. With the prospects of the establishment of a flourishing and extensive industry railway communication may have to be seriously considered.

Mr. Merriman: How is the Wolhuter school progressing?—It is working very well indeed.

How many boys have you at the school?—50 at Wolhuter. There will be 220 altogether when the three schools are all going, the East Rand, Wolhuter and Bantjes.

Chairman: Do you insist on the boys going through with the course?—We cannot insist on that, but they are beginning to understand the advantages of completing the course better. We want to get more and more boys. The mines are only too eager to utilise the services of these boys, and they can earn good wages and do well for themselves when they have completed the full course.

Mr. Merriman: In regard to the geological survey, have you anything in the shape of an economic survey going on?—Dr. Rogers, who was in the Cape Survey, is now director. One of our difficulties is that we are short of staff, and there are many economic problems requiring urgent investigation. For example, there is the question of the water problem of the Rand and the dolomite formation; and the effect of pumping on deep mines at the eastern end of the dolomite formation on the discharge from the Pretoria dolomites. That is a question on which we have one geologist working for the Irrigation Department. There are a number of points requiring investigation with regard to drainage in that area and it appears as if there are certain diorite and granite belts going through the dolomite which cut off the areas from one another. That has to be solved. In addition certain questions on the East Rand which are very important are being investigated by Dr. Rogers. There are a number of equally urgent matters, such as the investigation of lime deposits and other economic minerals. There is lime of various kinds throughout the country, and we require lime for agricultural purposes, for flux for iron ores, and other purposes. We have taken on Mr. Wybergh, who is a geologist, and he is working on the lime question, and we are also considering the extension of the mineral survey from the industrial and economic standpoint. Mr. Wybergh has got the Transvaal finished and a portion of Natal, and we hope to get the results out before very long. He is now in the Cape Province and is starting in the north and east, and working down. He will be able to give us information wanted on the lime question as well as gypsum. Then there is the question of the coal deposits and their development on the northern side of Natal and in the Eastern Transvaal, and Mr. Du Toit has been going through that area. It is one of the most hopeful areas in the Union for the ultimate



development of an iron industry, and for the establishment of a coal by-product industry which will be of the first importance industrially to the whole Union.

Then I gather that the regular scientific work of the survey is giving place somewhat to a mineral survey dealing with practical economic questions?—That is so. We are being compelled by force of circumstances and the necessity for investigating our raw materials in the Union caused by present shipping difficulties, to postpone the more ordinary mapping work of the survey and to deal with pressing investigations of mineral deposits with a view to ascertaining the actual position, character, extent and quality of various occurrences which appear to be of economic importance. In this direction we are following the recommendations of the Scientific Committee.

Chairman: Your investments in mine assistance have not turned out very well?—Although that money appears to have gone for the moment into the sea, at the same time in principle it has been of value. There is a French company which is so satisfied with the prospects that it is going into the concern, and they have had a large experience of anti-mony. If they can be kept going in the Murchison range a big industry may yet develop there. But the principle of assisting in metallurgical experiments of a practical kind which show a good prospect of advancing an industry which may prove of national importance, appears to be a sound one. All such experiments may not prove at once successful, but they constitute a form of industrial research which it is essential to encourage.

What is the explanation of par. 7 (iii.), p. 44, regarding financial assistance given to a syndicate at Pilgrim's Rest?—It was to enable them to get electrical power. We assisted the syndicate with the erection of the line, connecting them up with the main power line from the Transvaal Gold Mining-Estates. Owing to the war work has been stopped in that

area. Men have gone on active service, and very few of the diggers are left. The whole activity of the neighbourhood has dropped, and the result is that some of the mines are closed down. I do not think that even the money given there was thrown away because it helped to carry on work on the mines in that particular area. If it had not been for the war one cannot tell what would have happened there.

### A "Responsive" Shaft Signal Device.

A paper by Mr. B. Angwin (of East Pool mine) has been contributed to the proceedings of the Institution of Mining and Metallurgy. In order to obviate the continual cost caused by need for renewal of bell-wires in the "knocker-line" system at East Pool, Mr. Angwin started a search for an efficient and, at the same time, a cheap form of answering signal. The above-named device was the result. The apparatus relies for its operation on the ready transmission of a pulsation of air through a pipe, in conjunction with the fact that a comparatively low pressure of air is required to sound a whistle. The dimensioned drawings show the "shop details" for the cast work required in a working set and the various parts assembled, with the necessary connections. The present set consists of bored wrought-iron pipes for cylinders, wrought-iron reducers for cylinder covers, two smaller wrought-iron reducers and nipples for valve boxes, and levers, fulcrums, plungers, rods and rod-stays made on the mine, as was also the brazed four-way junction pipe carrying the whistle attachment. These built-up contrivances, six in number, have been in constant use for upwards of twelve months, and are as good now as when first put to work. There are  $\frac{1}{2}$  in. holes bored in the cylinder near the bottom to provide inlets for the air at the end of the stroke. A hole is tapped at the bottom end of the pump-plunger to facilitate attachment of an extra weight should this be required to bring the pump-plunger to its normal position at the bottom of its stroke. The whistle is provided with a sliding-sleeve silencer. It is not desirable to have a silencer fitted to the whistle in the engine-room, as there is a prime necessity for the engine-driver to hear the signals transmitted from the shafts and to be able to reply to them. Silencers may, however, be fitted to all shaft whistles, and the cage or skip onsetter should be instructed to slide the silencer over the whistle hole directly he has finished at one level. This is not absolutely imperative, but it ensures a more distinct sound for other whistles subsequently engaged.

## THE MINES AND THE TRANSVAAL LIQUOR LAW.

### Breakdown of the Endeavour to Maintain Prohibition for the Native.

GIVING evidence before the Select Committee on the Transvaal Liquor Law, Mr. E. L. R. Kelsey, legal adviser and joint secretary of the Chamber of Mines, said: I appear before the Committee in order to give evidence on behalf of the Transvaal Chamber of Mines, and I am conversant with the state of affairs prevailing on the Rand and the fact that a large number of people are annually sent to gaol for the sale of liquor to natives. The Transvaal Liquor Laws have not had the effect of preventing natives on the Rand from getting liquor, and the Chamber is of opinion that the endeavour to maintain prohibition for the native has broken down. The loss of shifts owing to drunkenness among the natives on the mines as shown by the Chamber's statistics is practically negligible, amounting to about 1 per cent. The number of shifts lost has been decreasing of recent years. The present law permits the free issue of beer to natives working on the mines; the issue of beer to natives is free of charge and is given them as a ration. The Chamber is of opinion that the system of prohibition has not worked, and that the time has come when a system of supplying the native with liquor under strict Government control should be given a trial. It would not be prepared to go beyond what are known as light liquors, such as beer and light wines. I believe light wine approximates an alcoholic strength of ten or twelve per cent. It would not in addition to beer be prepared to go beyond that at the commencement. Perhaps I might quote a paragraph of the Transvaal Liquor Commission's report of 1908, which, in principle, without being bound by the forms of alcohol mentioned, appears to be as worthy of consideration to-day as when written. It says on page 26: "We think that the supply of Kaffir beer to natives will probably attain in some measure the ends we have in view—the training of the native in self-control

and the diminution of the illicit trade. That a supply of wine might possibly attain the same ends more completely at least with that section of the natives which is already accustomed to wine, we are not prepared to deny. But we think that the probability of this is outweighed by the danger of teaching to the other section—the majority—the attractions of a stronger form of drink than they are at present prepared to resist. Nothing in the evidence warrants us in treating the supply to natives of any alcoholic liquor as other than an experiment which may prove a failure, and we feel strongly that, at the inception of an experiment of this character, it is better to go too slow than too fast. We feel confident that no great harm will be done by the supply of Kaffir beer under the conditions we have set out; we do not feel the same confidence in respect of wine. If a beginning is made with Kaffir beer, and the progress of the native justifies a further step along the same line, it will be easy to add wine to the list of permitted drinks. But, if wine be permitted at once and the result proves unsatisfactory, any attempt to recede will rouse strong opposition, not only among the natives themselves, but also from the great wine-producing industry which will have been created by the experiment. How strong that opposition will be may be judged from recent events in the Parliament of the Cape Colony. We doubt whether the step, once taken, could ever be retraced." I quite agree that it is better to go too slow than too fast. If it were considered from the point of view of materially reducing the illicit trade it would be sufficient to start with beer only. The industry would advocate doing so. Of course it is a question requiring a great deal of consideration. As the paragraph quoted says, whatever the first step may be it will be easy to add to the list of liquors that may be supplied to the native; it is as you say, a policy

of *festina lente*. The industry is prepared to go as far as light wine as the limit of what might be sold to the native at the initiation of the scheme. The Chamber would not be prepared to acquiesce in permitting natives to drink brandy; light wines from 10 to 12 per cent. of alcohol should be the limit in its opinion. With regard to the quantity that should be allowed, that depends on the alcoholic strength of the drink sold them. With regard to the Durban system of native canteens and eating-houses, I understand that the control amounts to this, that a boy will be served so long as he shows no perceptible signs of drunkenness. With regard to the quantity a native should be allowed to drink in the Transvaal, if he were sold light wine, the control might be on the lines of the Durban system, and in any case should be such that it would not be possible for him to obtain more than the amount decided upon as being good for him. The industry is of opinion that the whole system should be under State control. I have some figures here as to the domicile of the natives now on the Rand. At the present moment the total number of natives employed on the mines on the Rand is 180,521—that was the number on the 10th of February; the total is very low. In fact, there is a serious shortage of native labour at the moment; the average number employed is about 190,000 for the gold mines of the Witwatersrand, so that we are about 4,000 beneath our requirements. The figures I am about to give apply to the native employed by the mines, which are members of the Witwatersrand Native Labour Association; the number of Portuguese natives employed is 70,900, Cape Province natives 66,498. I do not know how many come from the respective parts of the Cape. There are 12,442 natives from Basutoland, 12,238 from the Transvaal, 9,647 from Natal and Zululand, 4,366 from Swaziland, 2,586 from Bechuanaland, 770 from the Orange Free State, 562 from British Nyasaland, 463 from Rhodesia, other natives 40, making a total of 180,521, including 139 registration certificates, 87 exemption certificates, and 130 under age. Other coloured persons employed on the mines number 1,353, of whom approximately 931 are Cape coloured men, and 422 Indians, making a grand total of 181,874 at the present time. You ask me how many of the natives coming from the Cape would come from the areas where liquor is not prohibited: I think that number would be comparatively small—about ten per cent.—but I will endeavour to obtain the actual number.\*

By Mr. Joubert: The point of view of what is good for the native certainly has to be considered in deciding upon what he should be allowed to drink. You may recollect that for many years the Chamber has held the view that prohibition was the best thing for the native and that alcohol in excess of what was necessary from the point of view of the health of the native would be a danger to the European community, but, as I have stated, it is thought the present system has broken down and the Chamber is prepared as an experiment to agree to the system of selling liquor to the

native under strict Government control, but it is not prepared to go beyond light wine and permit brandy to be sold to him. You say that the object of the Chamber is to get a fit labourer who can do his work in the mines properly. I think you put it too narrowly. Obviously it must be in the interest of the Chamber that the native should be maintained in a fit condition to do his labour. The Chamber also has to consider this question from the general point of view of the community. The Chamber is not prepared at the present time to acquiesce in selling to the native any stronger drink than the so-called light wines. The State control might be on the lines of the Durban system. With regard to the canteens, unless they are close together, each mine would require its own canteen, otherwise the natives would all want to go to mines where they had a canteen, and mines which had no canteens would be denuded of their labour. In regard to the question how the native is recruited, the native of Portuguese East Africa is recruited through the Witwatersrand Native Labour Association and the natives from other parts are recruited by the Native Recruiting Corporation.

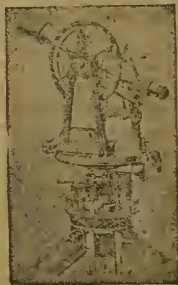
By Mr. de Waal: When I say that the Chamber is prepared to let natives have light wine, in addition to beer, I am referring to all natives and coloured people.

By Mr. Clayton: The Chamber is of opinion that prohibition has broken down, and, therefore, it feels that an experiment of the sale of light wine, as well as beer, to natives under strict Government control should be made, but it is not prepared to go beyond wine of 10 or 12 per cent.; if the Chamber thought that beer alone would, from the point of view of reducing the illicit liquor trade, prove a success, the Chamber would not wish to go further than the sale of beer.

### Electrical Equipment of Mines.

The electrical section of the U.S. Bureau of Mines, according to its last report, engaged in the study of problems relating to the use of electricity in mining and other industries, has during the past year completed, or nearly completed, many matters that have been pending for some time. Among these: (1) An approved list of portable electric mine lamps and of flame safety lamps; (2) the development of a methane detector; (3) electrical rules for mines. As a result of the Bureau's investigation, the portable electric mine lamps now in use in the mines of the States number more than 100,000. In the course of the investigation for the establishment of a list of permissible explosion-proof motors for use in mines, a new testing gallery was standardised, progress made in the testing and development of two motors for a coal-cutting equipment, and one motor for general use. Another investigation had as its object the establishment of a list of permissible storage-battery locomotives.

\* In 1917, 89,895 were recruited, of which 67,202 came from Transkei and 22,693 from other parts of Cape Province. E.L.R.K.]



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## THE NIGEL: MANAGER'S ANNUAL REPORT.

In his report for 1917 Mr. De Villiers, manager of the Nigel, writes: In accordance with your instructions all development was stopped in November, 1916, except that found to be necessary to facilitate the stoping of partially developed blocks of ore. The footage cut during 1917 was as under: Drives, 402 ft.; winzes, 85 ft.; raises, 393 ft.; crosscuts, 18 ft.; total, 898 ft. The payable ore reserves as at the 31st December, 1917, are estimated at 51,000 tons, calculated on a milling width of 36 inches, with an average value of 8.6 dwts. The above are segregated as follows: No. 3 shaft, Nigel section, 45,000 tons at 8.42 dwts.; C shaft, Rand Nigel section, 6,000 tons at 10.00 dwts. The following are the results obtained from reduction and cyanide operations: Mill: Stamps in operation (average), 60; tube mill in operation, 2; average running time, stamps, 827.818 days; average running time, tube mills, 345.539 days; ore milled, 141,800 tons; crushing duty per stamp per 24 hours, 7.209 tons; average screen samples, 6.070 fine dwts.; yield in bar gold, 22,979.454 fine ozs.; yield per ton milled, 3.241 fine dwts.; value of ore per ton before crushing, 6.515 fine dwts.; assay value of pulp leaving mill, 3.274 fine dwts. Cyanide works: Tonnage treated, sands 76,302 tons, slimes 65,418 tons; average value originals, sands 3.784 fine dwts., slimes 2.680 fine dwts.; yield in bar gold, sands 13,218.242 fine ozs., slimes 7,824 fine ozs.; yield per ton treated, sands 3.465 fine dwts., slimes 2.892 fine dwts.; assay value of residues, sands 0.404 fine dwts., slimes 0.290 fine dwts.; theoretical extraction, sands 89.327 per cent., slimes 89.185 per cent.; actual extraction, sands 91.561 per cent., slimes 89.262 per cent. Summary of ore treatment on basis of tons milled: Yield from mill, 22,979.454 fine ozs., per ton milled 3.241 dwts., percentage of yield 52.200; yield from sands, 13,218.242 fine ozs., per ton milled 1.864 dwts.,

percentage of yield 30.027; yield from slimes, 7,824.000 fine ozs., per ton milled 1.104 dwts., percentage of yield, 17.773; total current ore treatment, 44,021.696 fine ozs., per ton milled 6.209 dwts., percentage of yield, 100.000. Working costs: Mining, including mine development, 1916 19s. 6.742d., 1917 15s. 4.170d.; milling, including rock crushing, 1916 3s. 4.918d., 1917 3s. 7.393d.; surface transport, 1916 7.822d., 1917 5.870d.; cyaniding sands, 1916 2s. 5.458d., 1917 2s. 3.832d.; cyaniding slimes, 1916 1s. 0.667d., 1917 10.833d.; general charges, 1916 7.069d., 1917 6.146d.; total, 1916 £1 7s. 8.676d., 1917 £1 3s. 1.744d. No alterations or additions were made to buildings, which have been kept in repair. There has been no expenditure on capital account during the year. The water supply has been adequate for all requirements. The average labour employed for the year was 124 whites and 1,440 natives, as against 144 whites and 1,478 natives in 1916. The operations of the year were confined to stoping, milling and treating the ore reserves and ore derived from pack walls and sweepings. Of the 141,800 tons milled 78,000 tons were obtained from the ore reserves, which stood at 108,000 on the 31st December, 1916, and the balance from pack walls and sweepings. On your instructions of the 26th November, 1917, I made preparations to cease milling on or about the 31st December. On the 20th of that month all stoping was stopped and the broken ore conveyed to the mill, the crushing of which was finished on the 3rd January, 1918, and the mill closed down on that date. As soon as the sands and slimes now in the vats are treated and discharged and the cyanide works cleaned up, which will take until about the middle of February, the works will also be closed down and every precaution taken to protect the plant against deterioration. The removal of all rails, pipes, pumps, motors, winches, cables and appliances generally from the mine is now in hand, and about the end of February next the property can be handed over to the caretaker.

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### Institute of Metals.

The 1917 report of the Council of the Institute of Metals, presented at the tenth annual meeting, states that the stimulating influence of war conditions upon the activities of the Institute has continued to make itself felt during the past year. It is gratifying to know that these activities have in the main been of immediate value to the nation in its time of stress. In this connection the council have thought it right to place the resources of the Institute freely at the disposal of the chief officials, concerned with non-ferrous metals at the Ministry of Munitions. The more general employment of scientific metallurgists in works engaged directly and indirectly in the production of munitions of war has aroused the interest of technical and scientific experts and of manufacturers in the work of the Institute, and this has led to a very large increase in the applications for membership. The number of members on the roll of the Institute on 31st December, 1917, was 838, an increase of 228 on the year. This is an unprecedented advance, for which the council are considerably indebted to activities of members in Sheffield and Birmingham. The Corrosion Research Committee's work is still being conducted with the assistance of funds contributed by the Department of Scientific and Industrial Research, associations, firms and by the Institute. The Government grant-in-aid has been increased during the year from £650 to £1,000 per annum, the latter rate applying as from 1st October, 1917. A further Government grant-in-aid of £450 has been received, together with a grant of a similar amount from the British Electrical and Allied Manufacturers' Association. The aggregate sum of £900 has been placed at the disposal of the Institute in order to carry out an investigation into the cause, or causes, of the corrosion of condenser tubes on land by fresh water; the research is being carried out on lines parallel to those adopted in the case of the existing salt-water research. For the purpose of conducting this latest investigation a Fresh-Water Corrosion Research Committee was appointed as a sub-committee.



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## THE APRIL GOLD OUTPUT IN DETAIL.

Increase of £88,431.

In April the Transvaal mines produced 717,099 ozs. of fine gold, valued at £3,046,045, being an increase of 20,818 ozs., value £88,431, over the total for March. The official figures as announced this week are as follows:

Total output ... ..	717,099 ozs.
Value ... ..	£3,046,045
Increase ... ..	20,818 ozs.
Value ... ..	£88,431
Witwatersrand ... ..	697,733 ozs.
Value ... ..	£2,963,781
Increase ... ..	20,725 ozs.
Value ... ..	£88,032
Outside Districts ... ..	19,366 ozs.
Value ... ..	£82,264
Increase ... ..	93 ozs.
Value ... ..	£399
Stampa ... ..	9,011
Increase ... ..	81

The improvement of 20,728 ozs. in the Witwatersrand total indicates that the water troubles which so seriously interfered with operations in March are being overcome. This is reflected in the group profits for April, which show an increase of £64,200. The biggest increases in the individual returns from the Rand are as follows: Randfontein Central, £20,325; New Modderfontein, £11,380; Modderfontein B., £7,947; Government Areas, £7,527; New Heriot, £7,523; Simmer Deep, £6,274; Langlaagte Estate, £6,185; Crown Mines, £6,168; Jupiter, £5,666; Springs Mines, £4,490; and West Rand Consolidated, £4,481. The mines showing the biggest decreases are: Witwatersrand, £5,752; E.R.P.M., £8,508; and Ferreira Deep, £3,165.

## THE STAMP POSITION.

During the past month there were 9,011 stamps dropping on the Transvaal goldfields, as against 8,930 in March, an increase of 81. The official figures are as follows:

	Rand.	Outside.	Total.
April ... ..	8,686	325	9,011
March ... ..	8,600	320	8,930
Increase ... ..	86	—	81
Decrease ... ..	—	5	—

## NATIVE LABOUR.

The native labour figures for the past three months are:

	February.	March.	April.
On gold mines ... ..	181,066	183,055	182,492
On coal mines ... ..	11,243	11,076	11,322
On diamond mines ... ..	4,825	4,745	4,753
	197,134	198,876	198,567

## INDIVIDUAL RETURNS.

	Value.	Increase.	Decrease.
Bantjes ... ..	£23,057	£289	—
City and Suburban ... ..	40,952	2,655	—
City Deep ... ..	117,607	—	£2,192
Con. Langlaagte ... ..	55,938	2,336	—
Con. Main Reef ... ..	72,076	—	1,168
Durban Roodepoort ... ..	10,335	—	369
Ferreira Deep ... ..	72,330	—	3,165
Geduld Proprietary ... ..	60,969	200	—
Ginsberg ... ..	11,371	—	416

	Value.	Increase.	Decrease.
Glencairn ... ..	12,939	64	—
Government Areas ... ..	169,914	7,527	—
Knight Central ... ..	28,417	314	—
Luipaardsvlei ... ..	20,342	1,928	—
Modder Deep ... ..	87,529	2,175	—
New Modder ... ..	140,999	11,380	—
New Primrose ... ..	14,319	276	—
New Unified ... ..	12,136	1,330	—
Princess ... ..	26,217	—	106
Robinson ... ..	45,336	3,772	—
Rose Deep ... ..	63,724	1,176	—
Van Ryn Deep ... ..	91,793	—	5,752
Witwatersrand ... ..	45,162	238	—
Wit. Deep ... ..	38,922	—	1,958
Wolhuter ... ..	38,998	2,548	—
E.R.P.M. ... ..	188,650	—	3,504
Jupiter ... ..	27,716	5,666	—
Knights Deep ... ..	71,111	985	—
Robinson Deep ... ..	63,707	—	943
Simmer Deep ... ..	44,784	6,274	—
Simmer and Jack ... ..	56,605	—	1,411
Aurora West ... ..	16,290	756	—
Meyer and Charlton ... ..	35,375	—	1,771
New Goch ... ..	15,509	—	858
Roodepoort United ... ..	25,351	—	3,160
Van Ryn Estate ... ..	35,536	—	1,491
West Rand Consolidated ... ..	37,537	4,481	—
New Heriot ... ..	16,940	7,523	—
Village Deep ... ..	71,243	1,164	—
Brakpan ... ..	96,873	496	—
Crown Mines ... ..	230,423	6,168	—
Durban Deep ... ..	42,533	2,719	—
Village Main ... ..	37,554	—	1,037
Langlaagte Estate ... ..	51,202	6,185	—
Randfontein Central ... ..	171,281	20,325	—
New Kleinfontein ... ..	76,841	3,398	—
Geldenhuis Deep ... ..	61,609	395	—
Modder B. ... ..	102,213	7,947	—
Nourse Mines ... ..	54,656	2,413	—
Springs Mines ... ..	75,138	4,940	—
Miscellaneous ... ..	5,702	—	2,710

## OUTSIDE DISTRICTS.

Barrett ... ..	743	297	—
Sheba ... ..	3,891	—	221
Glynn's ... ..	7,009	—	148
T.G.M.E. ... ..	22,441	—	1,138
Sub Nigel ... ..	25,338	871	—
Miscellaneous ... ..	22,842	788	—

## GROUP PROFITS.

The group profits for the past three months are as follows:

	February.	March.	April.
Central Mining ... ..	240,203	276,812	309,029
Barnato ... ..	159,225	136,496	164,166
Gold Fields ... ..	33,840	28,711	71,165
General Mining ... ..	20,894	27,854	26,801
Mines Selection ... ..	63,322	70,634	81,837
Goerz ... ..	66,871	66,970	68,659
	584,355	607,477	671,677

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## PROGRESS ON GOERZ MINES.

### Latest Development Results from the Modder Deep, Geduld and Princess Estate.

THE Geduld directors' report for quarter ended 31st March, 1918, shows: Mine development redemption charged to working expenses, £16,637 10s.; expended on mine development, £11,720 8s. 2d.; redeemed in excess of actual expenditure, £4,917 1s. 10d. Summary of operations: Mined, 136,979 tons; waste sorted out (equal to 11.9 per cent.), 16,279 tons; milled, 121,000 tons; number of stamps, January 85 ran 29,838 days, February and March 100 ran 54,560 days; number of tube mills, 8 ran 82,561 days; sands treated, 42,290 tons; slimes treated, 77,818 tons. Mine development, etc.: Shaft sinking, etc.—No. 3 main incline, 538 ft.; intermediate incline, 498 ft.; No. 3 shaft sump drive, 20 ft.; total, 1,056 ft. Development—Driving, 1,892 ft.; winzes, 43 ft.; raises, 602 ft.; crosscuts, nil; sundries, 8 ft.; total, 2,545 ft. For the three months ended 31st March, 1918, the footage sampled totalled 3,040 ft., assaying 10.5 dwts. over 28 inches. Comparison of results: Tons milled: December, 1917, quarter, 114,100; March, 1918, quarter, 121,000; increase, 6,900. Working profit: December, 1917, quarter, £57,732; March, 1918, quarter, £57,163; decrease, £569. Working costs per ton milled: December, 1917, quarter, 20s. 1.5d.; March, 1918, quarter, 19s. 11.7d.; decrease, 1.8d. Yield per ton milled: December, 1917, quarter, 30s. 2.9d.; March, 1918, quarter, 29s. 5.1d.; decrease, 9.8d.

The Modderfontein Deep directors' report for quarter ended 31st March, 1918, shows that for the three months ended 31st March, 1918, the footage sampled totalled 510 feet, assaying 11.5 dwts. over 45 inches. No expenditure on capital account was incurred during the quarter. The development expenditure incurred during the quarter amounted to £3,888 10s. 10d., whereas the fixed charge

to working costs of 1s. per ton milled gives £6,225. Comparison of results: Tons milled: December, 1917, quarter, 128,100; March, 1918, quarter, 124,500; decrease, 3,600. Working profit: December, 1917, quarter, £146,296; March, 1918, quarter, £149,828; increase, £3,532. Working costs per ton milled: December, 1917, quarter, 16s. 4.9d.; March, 1918, quarter, 17s. 1.2d.; increase, 8.3d. Yield per ton milled: December, 1917, quarter, 39s. 3.0d.; March, 1918, quarter, 41s. 2.0d.; increase, 1s. 11.0d.

The Princess Estate directors' report for the quarter ended 31st March, 1918, shows that mine development, etc., was as follows: Shaft No. 1 (vertical)—Sinking (vertical portion), 52 ft.; sundries, 426 ft.; total, 478 ft. Development—Driving, 552 ft.; winzes, 217 ft.; raises, 435 ft.; crosscuts, nil; total, 1,204 ft. The footage sampled was as follows: South Reef, 200 ft., averaging 6 dwts. over 26 inches; Main Reef, 910 ft., averaging 7.9 dwts. over 47 inches. It is estimated that the payable ore (based on the milling width) developed by the above footage is: South Reef, 6,955 tons; Main Reef, 11,619 tons; total, 18,574 tons. These figures are subject to re-calculation at the end of the year, when block values are made out. Consequent on the reconstruction of the company, the registered and issued capital now stands at £107,503 6s., divided into 1,075,033 shares of the nominal value of 2s. each. The work in connection with the alterations at No. 1 vertical shaft is well in hand. No sinking was accomplished in the incline portion on account of a further influx of water, due to the abnormal rainfall. It is expected that sinking will be resumed shortly. Comparison of results: Tons milled: December, 1917, quarter, 61,800; March, 1918, quarter, 55,700; decrease, 6,100. Working costs per ton milled: December, 1917, quarter, 26s. 3.7d.; March, 1918, quarter, 29s. 1.2d.; increase, 2s. 9.5d. Yield per ton milled: December, 1917, quarter, 26s. 6.8d.; March, 1918, quarter, 27s. 3.7d.; increase, 8.9d.

### Fuel Economy Problem.

Addressing members of the Birmingham Rotary Club, Mr. A. E. A. Edwards dealt with the question of fuel economy, and remarked that of all sources of power the heat engine was the least efficient. It was a high-class plant indeed that gave 8 per cent. of the fuel over a week's work. The average steam plant probably did not yield more than 1 per cent. of the value. The super-electric power stations on the coal fields were not likely to mature into anything practical, but, on the other hand, smaller stations situated in residential areas were far more likely to prove paying propositions. If, instead of turning 61 per cent. of heat into the atmosphere, we turned it into a heating system, they would put 90 per cent. of the waste heat value of the steam into the heating system. This heat would be distributed around the neighbourhood for domestic hot water. In fact, electricity would be a by-product, and heating and hot water supply the main source of income from the central station. The system was in use in America to-day. There was no reason why the exhaust steam from the factories should not be collected, metered and sold to the heating supply company.

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## LATEST RESULTS FROM THE GENERAL MINING GROUP

### MEYER AND CHARLTON.

The total profit for the quarter was £67,092 0s. 9d. The expenditure on capital account amounted to £928 7s. Operations were necessarily curtailed by the heavy rainfall during the latter part of February, which had the effect of flooding the lower levels of the mine. The development footage sampled totalled 306 feet, and gave the following results over an average stoping width of 46.4 inches: Payable, 211 feet, having an average value of 30.20 dwts.; unpayable, 95 feet, having an average value of 2.40 dwts.

### VAN RYN ESTATE.

Total profit for the quarter, £25,400 19s. 9d. The expenditure on capital account amounted to £235. The decreased profits for the quarter are due to a falling off in the grade of the ore milled. The development footage sampled totalled 435 feet, and gave the following results over an average stoping width of 39 inches: Payable, 190 feet, having an average value of 11.5 dwts.; unpayable, 245 feet, having an average value of 1.1 dwts.

### WEST RAND CONSOLIDATED.

Total loss for the quarter, £2,352 10s. 4d. The expenditure on capital account amounted to £4,718 6s. 2d. Operations at the mine during the quarter were seriously affected by the abnormal rainfall, which, after being exceptionally heavy during January, reached a climax on February 14, when over 14 inches of rain fell in 12 hours. As a result, the lower levels of the mine were flooded, and since the flow of water met with underground was beyond the capacity of the pumping plant, baling with the skips had to be resorted to, with consequent reduction of the quantity of ore which it was possible to hoist. This not only resulted in a serious loss of revenue, but, since the expenditure was adversely affected by greatly increased pumping costs, work during February and March was carried on at a loss. Additional pumping plant has now been installed, and, at the present time, although the flow of water met with underground is still abnormal, the position is improving, and hoisting ore is not being interfered with to any great extent. The development footage sampled totalled 2,081 feet, and gave the following results over an average stoping width of 50 inches: Payable, 1,148 feet, having an average value of 8.25 dwts.; unpayable, 933 feet, having an average value of 2.85 dwts.

### AURORA WEST.

Total profit for the quarter, £3,903 11s. The expenditure on capital account amounted to £55 7s. 11d. Results were seriously affected during the latter half of February and the whole of March by the excessive rains which flooded the lower workings of the mine, entailing heavy pumping and baling operations, with consequent considerably increased expenditure and reduced tonnage. The development footage sampled totalled 655 feet, and gave the following results over an average stoping width of 42 inches: Payable, 300 feet, having an average value of 8.30 dwts.; unpayable, 355 feet, having an average value of 3.45 dwts.

### ROODEPOORT U.M.R.

Total loss for the quarter, £26 19s. 3d. The expenditure on capital account amounted to £344 11s. The loss is due to decreased tonnage milled for February and March and to increased expenditure, as a result of the flooding of the lower levels of the mine, consequent on the abnormal rains experienced in February. The development footage sampled totalled 1,410 feet, and gave the following results over an average stoping width of 45.47 inches: Payable, 635 feet, having an average value of 7.96 dwts.; unpayable, 775 feet, having an average value of 2.92 dwts.

### NEW GOCH.

Total profit for the quarter, £410 16s. 2d. The expenditure on capital account amounted to £2,566 18s. 2d. The abnormal rainfall during February resulted in the flooding of the bottom levels of the mine, necessitating continuous baling and pumping operations during the remainder of the quarter. Working costs were consequently considerably increased by the additional expenditure involved. The development footage sampled totalled 805 feet, and gave the following results over an average stoping width of 55 inches: Payable, 710 feet, having an average value of 8.41 dwts.; unpayable, 95 feet, having an average value of 2.93 dwts.

### New Rolling Stock for S.A.R.

The following figures showing the number of new engines, coaching and wagon stock which have been placed in service by the S.A.R. from 1st of January, 1910, up to the 31st October, 1917, and also the stock still on order or authorised at the latter date, will show that the Administration has endeavoured to amply provide for such development:—

	Engines.	Coaching Stock.	Wagon Stock.
1910 ... ..	63	56	511
1911 ... ..	25	131	636
1912 ... ..	42	126	698
1913 ... ..	28	114	953
1914 ... ..	95	155	1,193
1915 ... ..	94	85	1,628
1916 ... ..	15	67	1,132
1st Jan. to 31st Oct., 1917 ... ..	19	18	194
Grand total ...	381	752	6,945

The following new engines and rolling stock were still on order or authorised at 31st October, 1917: Engines, 143; engine tenders, 24; coaching stock, 238; wagon stock, 2,471. Unfortunately since the outbreak of the European war it has been practically impossible to obtain new engines and rolling stock from Great Britain, and orders which were accepted prior to and shortly after the commencement of hostilities are either proceeding very slowly or have been postponed indefinitely, and there appears to be very little prospect of delivery being obtained of a large proportion of the engines and stock until after peace is proclaimed. In view of these difficulties and the necessity for meeting the requirements in new rolling stock orders for 38 large locomotives were placed in America, delivery of which is due about June, 1918, but now that America is also actively engaged in the war, it is quite possible that delivery of these locomotives will also be delayed. Everything possible, however, is being done to meet the requirements of traffic.

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## TUNGSTEN ORES IN SOUTHERN RHODESIA.\*

By H. B. MAUFE.

TUNGSTEN (or Wolfram) is in great demand at the present time for the manufacture of special steels, particularly high-speed tool steels. The use of these special steels allows a machine, such as a lathe, to be run at a high speed, the output of the machine being thereby increased four or five-fold. The effect of this in expediting the output of munitions has been enormous. Early in the war the Imperial Government fixed a maximum price for tungsten ores and their products, and prohibited their export from British Dominions. Tungsten ores are bought according to the percentage of tungstic acid (WO<sub>3</sub>), they contain, as determined by assay. The price is quoted in shillings per unit (that is, one per cent.) of tungstic acid. The British South Africa Company a short time ago received information that the Ministry of Munitions has agreed to increase the price of tungsten ore to 60s. a unit on a 65 per cent. basis of tungstic acid. This means that an ore containing 65 per cent. of tungstic acid is valued at 60s. x 65 = £195 per long ton. £195 is the price paid for a long ton of dry ore delivered in warehouse, London. From this there is to be deducted rail, freight and insurance to London, landing charges at London, half cost of sampling and assay (about £2 10s.), brokerage (one per cent.), and interest on freight, etc. Messrs. H. A. Watson and Co. are the official brokers. If the ore does not assay as much as 65 per cent., a penalty of 3d. per unit is made for ore down to 60 per cent. For each unit below 60 per cent. down to 55 per cent., the penalty is 6d. per unit. Thus a ton of ore assaying 61 per cent. is valued at 59s. x 61 = £179 19s. The ore must be reasonably free from impurities, such as tin, bismuth, arsenic, and excessive sulphur. If the ore contain more than one per cent. of tin, there is no penalty up to four per cent., but the tin will not be paid for. If there is over four per cent. of tin, the producer will receive the value of the tin, but will have to pay the costs of separation. With regard to shipping charges, the Imperial Government agree to pay the difference in freight and insurance between the amount actually paid and the rates ruling in September, 1915. This means that the producer's expenses for shipping the ore to England are definitely limited on items liable to fluctuation. It appears that freight in September, 1915, was 30s., as against 165s. with a 20 per cent. war surcharge at the present time, whilst war risk insurance was £1 per cent. as against £5 5s. now. It is unlikely that the producer's shipping expenses can amount to more than £35 per ton of ordinary ore. A good profit seems to be assured. The Imperial Government, however, offer alternatively to buy the ore at the mine at the rate of 52s. 6d. per unit, or £170 12s. 6d. per long ton of 65 per cent. ore. This offer relieves the producer of all transport and shipping charges, and in certain cases will no doubt be advantageous. Full particulars may be obtained by those interested from the Resident Mining Engineer, P.O. Box 186, Bulawayo. The Imperial Government also guarantee the above prices for the duration of the war and for six months afterwards. The second offer of the Imperial Government definitely establishes a local market in tungsten ores at a fixed price, of which any producer might take advantage. The establishment of a local market in other minerals, of which copper and asbestos are examples, has stimulated prospecting and the development of the deposits of these minerals, and has been a determining factor in the increase of their output. In the following pages the wide distribution of tungsten ores throughout Southern Rhodesia is proved, and when this and the definite offers of the Imperial Government for the purchase of the ores are realised, a large increase of the output may be confidently expected.

### THE KINDS OF TUNGSTEN ORE.

Two kinds of tungsten (wolfram) are known in Rhodesia: wolframite and scheelite. Wolframite is an opaque black mineral which can be scratched by the point of a knife, and gives a reddish-brown streak. A characteristic which distinguishes it from other black minerals, such as magnetite or tourmaline, is the perfect cleavage in one direction by which this mineral can be broken into flat plates having shining surfaces, whilst the edges are rougher and not so bright. It may be weakly magnetic, probably when it contains a large percentage of iron. It is a little heavier than tinstone, having a specific gravity of about 7.3. Wolframite is a tungstate of iron and manganese, and contains, when pure, over 76 per cent. of tungstic acid (WO<sub>3</sub>). Scheelite is a pale coloured mineral, and may be white, greyish, greenish, yellowish, or pinkish. A freshly broken face is not so glassy as quartz, and is easily scratched by the point of a knife, giving a white streak. Its great weight (specific gravity 6.0) allows it to be picked out readily from the commoner pale coloured minerals. When boiled in weak hydrochloric acid it becomes coated with bright yellow powder, which is soluble in an alkali. Scheelite is tungstate of lime, and contains when pure over 80 per cent. of tungstic acid (WO<sub>3</sub>). Since neither wolframite nor scheelite oxidise at all readily, they are both found throughout the oxidised zone right up to the surface. In certain conditions slight oxidation does take place and gives rise to a yellow or yellowish green incrustation of tungstic oxide (tungstite). This mineral, however, does not occur in marketable quantity, and cannot be called an ore of tungsten. Although wolframite and scheelite concentrates are usually marketed separately, no difficulty will be found in marketing a mixed concentrate. The mixture of a little scheelite with a wolframite concentrate, as in the product of the Essexvale reefs and rubble, increases the percentage

of tungstic acid (WO<sub>3</sub>) and the value of the concentrate. As regards the pegging and registration of claims containing tungsten ores, it is noticeable that Part V. of the Mining Law provides for "tungsten" and for "scheelite" separately.

### THEIR KNOWN OCCURRENCES.

**Bulalima-Mangwe District.**—On the farm Greenfields, situated twelve miles south of Marula Siding and near the western end of the Matopo Hills, wolframite has been found in small quantity, together with tinstone in a red granite.

**Bulawayo District.**—Scheelite is reported to be common in small quantities in many of the reefs around Bulawayo. It is usually seen as a tail in the pan.

**Gwanda District.**—(1) A small specimen of wolframite has been received from a short distance above Dik-a-dik drift on the Limpopo River. This drift is about three miles down stream from the Limpopo Police Camp at Liebig's drift. Traces of matrix adhering to the specimen indicate that the wolframite comes from a micaceous rock, probably a greisen or griesenised pegmatite. Other reports have been received of the occurrence of either wolframite or scheelite in the country south and west of the Umzingwaoe coalfield, and in prospecting this tract the possible occurrence of these minerals in quantities profitable to work should not be overlooked. (2) Scheelite has been found in an amphibolite, which is believed to have come from the Rubicon claims, near the Farvie Mine.

**Gwelo District.**—(1) Pale grey scheelite is associated with quartz in the reef on Chicago No. 2 claims near Que Que. The scheelite appears to be present in a quantity sufficient to make it worth picking and concentration. This is an instance of the occurrence of tungsten ore in association with a gold reef. (2) Another case of the occurrence of tungsten ore in a gold reef has been reported from the Lower Gwelo district. A fair amount of good grade scheelite occurs in a gold quartz reef on the Irene claims.

**Hartley District.**—(1) The Scheelite King Mine, situated on the western side of White Waters farm nine miles west of Gatooma, produced 4½ tons of scheelite before the mine was closed down a few years ago. The scheelite is of a dull greenish colour with the characteristic greasy lustre, and occurs in lumps scattered through an irregular white quartz body forming part of a reef aligned north and south. The ore was cobbled and hand-picked by natives; re-cobbled and concentrated by panning at the water half a mile from the mine. The ore is believed to have narrowed in depth near water-level, but it is unlikely that the body worked is the only one in the reef. The claims are situated on a belt of red soil within a granite mass and very close to the edge of the granite. Some of the workmen show felsite, slightly schistose and irregularly veined with quartz. The red soil belt lies near the western margin of a mass of granite which stretches from the Half Way House on the Gatooma-Golden Valley road in the south-south-westerly direction across the White Waters and at least two miles beyond the Umsweswe River. This mass, and particularly its margins, should be prospected for tungsten ore. (2) From the Mombi River, about two miles south of Duchess Hill, a broad belt of encaissed granite runs in a south-westerly direction to the Umsweswe River. A number of gold quartz reefs are known in this belt, the best known being grouped around the Thistle-Etna Mine and again around the Lydia Mine. Scheelite occurs in many of the reefs. A tail of scheelite is generally found in the pan, and in several reefs it occurs in visible grains or in lumps. Owing to its weight, it is not difficult to separate from the crushed ore, and could probably be made a profitable by-product in some cases.

(To be continued.)

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\* From Report No. 4 of the Southern Rhodesia Geological Survey.

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## THE WEEK IN THE SHAREMARKET.

Better Opening Succeeded by Dulness—Improvement on Thursday.

THE market again opened firm on Saturday morning. There were further dealings in Lace Props at 11s. 9d. to 12s. At the call Modder East and the options were firm, but a large number of shares appear to be still for sale. Sub Nigels went back after their recent advance, as also Geduld Props. Springs were slightly easier, but Van Ryn Deeps and Government Areas are holding their own. On Monday morning there was some easing off in Government Areas, Springs Mines and Sub Nigels. Van Ryn Deeps were unchanged and so were Modder Easts and their options. New Modders gained a quarter and more were wanted at the advanced price. Business was quiet throughout the day, Lace Props being the most active stock. At the opening on Tuesday Lace Props were again in demand at 12s.—12s. 3d., but only one sale went through at the lower figure. The call was dull and the volume of sales fell to half of the previous day's record. Van Ryn Deeps were firm and Springs a turn harder, but Government Areas, Geduld Props and Sub Nigels came easier. The Modder stocks were unchanged, but there was little indication to do business. During the day fairly active dealing took place in Lace Props, which rose to 12s. 7d., but subsequently fell back to 12s. 4d. The market generally closed easier. On Wednesday morning there was a falling off in prices all along the line, with the exception of Van Ryn Deeps, Pretoria Cements and Rand Selections. The strike bogey caused a further drop during the afternoon. Van Ryn Deeps fell to 71s. 6d., Sub Nigels to 25s., Springs to 67s. 9d., Government Areas to 72s. 9d., Modder Easts to 19s. 3d., and Geduld Props to 39s. Prices steadied somewhat on Thursday morning and business was more active. The outside transactions for the week consisted of: Sales: South Van Ryns, 14s. 6d. to 14s.; Sakalavas, 11s. 6d. to 10s.; Union Tins, 8s. 9d.; Alkalies, 70s.; Maganyene, 19s.; Montelcos, 37s.; Phoenix, 11d.

On Friday morning the best that can be said is, that if the market was no better it was no worse. Business was restricted and the numbers of shares dealt in were limited. The following alterations in prices are noted:—Sales: Main Reef, 13s. 6d.; East Rands, 4s. 3d.; Modder East three-year Options, 6s.; Heriots, 21s.; Kleinfonteins, 13s. sellers; Pretoria Cements, £5 19s. and buyer; Rand Klips, 9s. 1d. and seller; Rooibergs, 13s. and buyer; Sub Nigel, 25s. 3d.; Randfonteins, 12s. 4d.; Van Ryn Deeps, 71s. 9d. and seller. Buyers and sellers: Brakpan, 90s., 93s.; City Deeps, 58s. 6d., 59s. 6d.; Jupiters, 3s. 10d., 4s.; Leeuwoorts, 21s., 21s. 6d.; Modder Deeps, £7 6s., £7 7s.; Modder East Options, four-years, 7s., 7s. 2d.; Rand Selections, 93s., 94s.; Springs Mines, 68s., 68s. 6d.; Wit, Deeps, 7s. 9d., 8s. 6d.

	Fri. 10th.	Sat. 11th.	Mon. 13th.	Tues. 14th.	Wed. 15th.	Thurs. 16th.
African Farms . . .	9 6*	9 6*	9 9*	9 0*	9 0*	9 0*
Anglo-Amer. Corp. . .	31 0*	—	33 0*	30 0*	31 0*	31 0*
Apex Mines . . .	7 6*	7 6*	7 6*	7 9*	7 9*	7 9*
Aurora Wests . . .	—	—	—	10 0*	10 0*	10 0*
Bantjes Consolidated	3 6	3 3*	3 3*	3 3*	3 0*	3 0*
Brakpan Mines . . .	—	90 0*	90 0*	90 0*	95 0*	95 0*
Breyten Collieries . .	—	11 3*	—	—	—	11 8*
Brick & Potteries . .	—	—	—	3 9*	—	3 9*
Bushveld Tins . . .	0 10†	0 9*	0 9*	0 8*	0 9*	0 10
Cassell Coals . . .	—	29 0*	29 0*	29 0*	—	28 0*
Cinderella Cons. . .	3 0*	3 0*	3 0*	3 0*	3 0*	5 0†
City & Suburbans . .	13 6*	13 6*	13 6*	13 6*	13 6*	13 6*
City Deeps . . .	59 6*	59 9*	60 0†	59 0	58 0	57 6*
Cloverfield Mines . .	—	8 9*	8 9*	9 0†	9 0†	8 4*
Clydesdale Collieries	15 0*	15 0*	—	—	15 0*	15 0*
Concrete Construc. .	—	6 3*	6 3*	6 3*	6 4*	6 0*
Con. Investments . .	—	—	—	—	—	18 0*
Con. Langlaagtes . .	17 9†	17 9†	17 9†	17 9†	17 9†	17 6†
Con. Main Reefs . .	13 6*	13 6*	13 0	—	13 6*	13 6†
Con. Mines Selection	27 0*	28 0	—	28 0*	29 0†	28 6†
Coronation Collieries	32 6*	—	32 0*	32 0*	—	—
Coronation Freeholds	1 4*	1 4*	1 4*	1 5*	1 6†	1 3*
Crown Diamonds . .	—	5 0†	5 0†	5 0†	5 0†	5 0†
Daggafontein Mines .	25 3	24 6*	24 0*	24 0*	23 3*	23 9
Do. Options . . .	7 3*	7 6*	7 3*	7 8†	7 3*	7 0†
Durban Road Deeps .	9 0*	—	10 0†	9 0*	9 0*	8 0*
East Rand Coals . . .	2 1*	2 1*	2 1*	2 1*	2 1*	2 1*
East Rand Deeps . .	—	0 9*	0 9*	0 9*	1 0†	0 9*
E.R. Minings . . .	17 0†	—	17 0	—	16 6*	16 6

	Fri. 10th.	Sat. 11th.	Mon. 13th.	Tues. 14th.	Wed. 15th.	Thurs. 16th.
East Rand Props. . .	4 3*	4 6	3 9†	4 3*	4 6*	4 6
Eastern Golds . . .	1 1*	1 1*	1 3	—	1 1*	—
F. Smith Diamonds . .	2 10*	2 10	2 10*	2 10*	2 9*	2 9*
Geduld Props. . .	41 6	40 9*	40 6*	40 6	40 6†	39 0*
Glencairn . . .	—	1 3*	—	—	—	1 0*
Glencoe Collieries . .	7 6*	7 6*	8 0†	8 0†	8 0†	7 6*
Glyn's Lydenburgs . .	17 3*	17 6*	17 6*	—	18 3*	18 6*
Government Areas . .	74 9	74 9*	74 9	74 1½	73 6	73 3
Jupiters . . .	4 0*	4 0*	4 6†	4 6†	4 6†	3 6*
Klerksdorp Props. . .	1 9*	1 10*	1 9*	—	1 11*	1 11*
Knight Centrals . . .	3 8	3 6	3 3	3 3*	3 3*	3 3
Lace Props. . .	12 3	12 0	11 10	12 0*	12 4	12 1
Leeuwoort Tins . . .	22 0	21 9	21 0	21 0*	21 0	20 9*
Lydenburg Farms . .	9 9	9 9*	9 7	9 7*	9 6*	9 7
Main Reef Wests . . .	2 9*	—	—	—	—	2 8*
Meyer & Charltons . .	—	—	—	90 0*	—	—
Middelvllei Est. . .	1 3†	—	—	—	—	—
Modder B's . . .	155 6*	155 0	157 0†	156 6†	153 6	150 0*
Modder Deep . . .	145 6*	147 0	147 0	146 0*	147 6	144 0*
Modder Easts . . .	20 0	20 0	20 0	19 9*	19 4½*	19 3
Do. Options (3 yrs.) .	6 4	6 6	6 6	—	—	6 0*
Do. Options (4 yrs.) .	7 6*	7 6*	7 6*	7 9†	7 7†	7 0*
Natal Navig. Col. . .	20 0*	20 0*	—	20 0*	20 0*	—
National Banks . . .	—	£13 15†	—	£13 15†	—	£13 15*
New Boksburgs . . .	1 1*	—	1 1*	—	1 2†	—
New Eland Diamonds	30 0†	30 0†	30 0†	30 0†	30 0†	30 0†
New Era Cons. . .	10 4	10 5*	10 4	10 0*	10 0*	10 0
New Geduld Deeps . .	5 9*	5 10*	5 9*	5 9*	5 9*	5 9*
New Heriots . . .	21 3*	—	21 3*	—	—	—
New Kleinfonteins . .	13 0*	13 3*	13 3*	13 0*	13 0*	13 1*
New Modders . . .	£23*	£23*	£23½	£23½	£22½*	£22½*
New Unifeds . . .	5 0*	5 3*	5 3*	5 9*	5 3*	5 3*
Nigels . . .	3 9*	—	4 0*	4 0	3 9*	3 10*
Nourse Mines . . .	18 6*	—	17 6*	17 9	17 6*	—
Premier Preferreds . .	—	—	—	140 0*	147 6†	—
Pretoria Cements . .	115 0*	117 6*	118 0*	117 6*	117 6*	120 0†
Princess Estates . .	3 3*	2 2*	2 2	2 1*	2 0*	2 0*
Rand Collieries . . .	—	—	2 0*	—	—	2 0*
Rand Klips . . .	9 6	9 6*	9 7*	—	—	9 5
Rand Nucleus . . .	1 2*	1 2*	1 2*	1 2*	1 3	1 2*
Rand Select. Corp. . .	90 0*	90 0*	90 0*	90 0*	90 6*	91 0*
Randfontein Deeps . .	—	—	4 0†	4 0†	4 0†	4 0†
Randfontein Est. . .	12 6*	12 6*	12 6*	12 6*	12 6	12 6*
Roberts Victors . . .	—	—	6 0†	6 0†	—	6 0†
Rooibergs . . .	13 0*	—	12 10*	12 10*	12 9*	12 9*
Rodepoort Uniteds . .	3 9*	—	3 9*	3 9*	—	—
Simmer & Jacks . . .	—	—	2 6*	2 6*	2 6*	2 6*
Simmer Deeps . . .	1 10*	—	1 10*	1 10*	1 10*	1 11*
S.A. Breweries . . .	27 0†	26 0†	—	—	—	26 0†
S.A. Lands . . .	6 3	6 2*	6 1	6 0*	6 3	6 2
Springs Mines . . .	69 6	69 4†	68 9	69 0	68 0*	68 6
Sub Nigels . . .	26 0	25 7½	25 3*	25 6*	25 6	25 6
Swaziland Tins . . .	—	—	—	—	—	31 6†
Transvaal Lands . .	12 6*	12 6*	—	12 6*	12 6*	—
Trans. G.M. Est. . .	13 0*	13 0*	13 0*	13 0*	13 6†	13 6†
Van Ryn Deeps . . .	71 6	72 0	72 0	72 0	72 0	71 6
Village Deeps . . .	17 0	17 0	16 9*	16 6*	16 9*	16 9*
Village Main Reefs . .	11 0*	—	11 0*	11 0*	11 0*	11 0*
Western Rand Estates	2 0*	—	2 3	—	1 10*	1 10*
Wit. Deeps . . .	8 9*	—	9 3†	8 9	8 6	8 2†
Woluhutens . . .	4 0*	—	4 0*	4 0*	4 0*	4 0
Zaaiplaats Tins . . .	18 4	18 4	18 2	18 0*	17 11	17 11
Union 5 per cent. . .	£100†	£100†	£100*	£100*	£100*	£100*
New State Areas . .	18 9	19 0	19 0	18 6*	18 9	18 9

\*Buyers. †Sellers. ‡Odd lots. §Ex London.

## PERSONAL.

Mr. C. Glyn succeeds Mr. Rouillard as Manager of the Durban Rodepoort Deep, and is succeeded at the City and Suburban by Mr. Hilton, of the Village Main Reef. Mr. Chiltern becomes Manager of the Village Main.

\* \* \* \* \*

The death of Mr. Wm. Beachy Head occurred somewhat suddenly on Monday at the Rand Club. He was 63 years of age. Coming to South Africa nearly 40 years ago, he served in the Frontier Mounted Police (which afterwards became the C.M.R.), before coming to the Rand in 1889. Here he became associated with the late Sir Geo. Farrar, and interested himself greatly in the development of coal mining. At the time of the Raid he was a member of the Reform Committee. His son-in-law, Mr. Hely Hutchinson, of the Goldfields, is serving in France.

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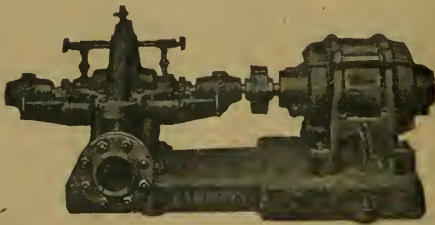
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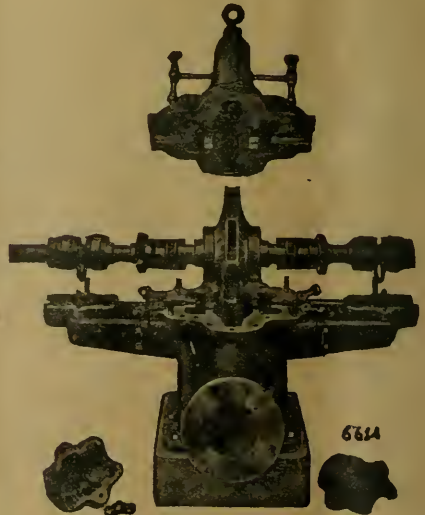
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**THE WEEK IN THE MINING MATERIAL AND ENGINEERING TRADES.****Effect of the Strikes—Business Very Quiet—Iron and Steel Wanted for all Parts—The Pipe Trade—Turpentine Scarce—Second-hand Trade.**

The strikes and the accompanying rumours have upset men's minds, and call for reference here, because whatever affects trade cannot be overlooked in these notes. The idea has taken hold that further demands from the Reef must adversely affect the poorer grade mines, which may throw a lot of machinery and material into the local market. On the whole, perhaps, this would not be bad for the mining industry, but it may mean less business for the merchants, and they are doing badly to-day. Two leading firms look upon the Commercial Exchange as a side line, because the position is reduced to practically one buying office. This buyer is now receiving material from both Britain and America, which is duly handed over to the merchants originally ordering same, anywhere during 1917, and through them distributed to the mines. There is also a further tightening up of economic conditions on the mines, therefore the leakage and waste have been reduced to a minimum. There seems to be plenty of second-hand material for substituting and supplementing wherever possible, so as to save new goods. Again we have had something like 50,000 tons of mining material received into South Africa since Christmas, and to-day very few things cannot be had in Johannesburg, including second-hand substitutes, providing one is willing to pay the price. For example, a large parcel of somewhat ancient material was sold during the week by a Johannesburg firm to the coalfields, running into four figures. The manager was surprised when the buyer, a genuine consumer, as apart from a speculator, said that he would take the lot at the high figure asked. This is what is absorbing our stocks, which must of necessity decrease unless replenished from overseas. Here again comes the shipping difficulty, which cannot be fathomed, now the whole control has passed into the hands of the British and American Governments.

**IRON, STEEL AND METALS.**

The latest price of tin in London is £370 per ton. The nut question is beginning to be troublesome, as the  $\frac{5}{8}$  in. size is up to 95s. per 100 lbs., also  $3\frac{1}{2}$  in. by  $\frac{5}{8}$  in. are 1s. 9d. per lb. A quantity of the latter was wanted, but the broker could only obtain a couple of bags in town. There is a scarcity of  $\frac{1}{2}$  in. round imported iron, but it is understood there is some at the coast to come forward. There are enquiries from all parts of Africa for imported bar iron. An order is on hand from Mombasa for a decent parcel, some of which may be sent from the coast. A large consignment of copper wire has been received from Japan. Our tin mines will soon control the trade of South Africa, particularly now that the price has risen so high in the London market. Asbestos from our own mines as well as mica, bid fair to go well ahead during the war at all events. These, however lack the up-to-date machinery, although local ingenuity is doing much. A few new steel plates are in the market, for which 85s. are asked; the trade is chiefly being fed with the ample supplies of the second-hand kinds. New piping over two inches is difficult to obtain, but there are plenty of the smaller sizes. An overseas firm's representative cannot understand the absence of business in new pipes and fittings. It may be that the second-hand dealers are monopolising the trade, what little is going.

**BUILDINGS AND BUILDING MATERIALS.**

Deals are steady at from 1s. 8d. to 1s. 9 $\frac{1}{2}$ d. per ft. to the trade, but 1s. 11d. to 2s. for small quantities. Teak is up 2s. per ft.—21s. to 22s. Floor brads have advanced from 60s. to 65s. per 100 lbs., and wire nails are from 50s. to 90s. according to sizes, some of which are not to be had. Bricks have become freer, but not cheaper. Cement is still very scarce, and although the price is recognised to be 9s. 3d. per bag, yet a contractor had to pay 11s. 6d. each for five

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bags, and another for one bag 15s. to finish off work. There is certain work that must be done in such a large place as Johannesburg, but the idea is that the strike atmosphere will check private enterprise. The anxious feeling is not what has happened but what is likely to happen both in the matter of future strikes and the war.

#### OILS, PAINTS, COLOURS AND WHITE LEAD.

Business went off during the strike, as the paint works had to stop in the absence of the municipal electrical power. The white lead position is much the same, waiting on American supplies. Turpentine is very scarce, not only in Johannesburg, but throughout the country, judging from the enquiry telegrams from all parts. Salad oil has advanced to 112s. 6d.—115s., and second quality 72s. 6d.—77s. 6d. Olive oil, 30s.—35s. a gallon, with very little available. Cylinder oil is higher, 37s. 6d.—45s. two fours.

#### SECOND-HAND MATERIAL.

There are enquiries in the market for large boilers for industrial purposes from various parts of the country. Another Rhodesian man wired during the week to see what bargains can be picked up in mining material and machinery—particularly spares. There was a buyer about during the week wanting several large sheds, presumably to start a small factory of some kind. On the whole business has been on the poor side during the week and the outlook is not hopeful, because Johannesburg is made the dumping ground for South Africa. The latest example is that of a derelict brewery plant being sent here for sale by auction. However, it will only take a little while to absorb, as the second-hand dealers are fairly well-to-do, and their market also extends to all parts of South Africa.

#### VARIOUS TRADE ITEMS.

Plumbago crucibles are from 5d. to 6d. lb. A coffee ship, arranged from South America to the Cape, has been diverted; however, for the next six months we have plenty of coffee. The coming Natal sugar crops are likely to be a record, hence a slight reduction in price can be expected. There is said to be somewhat of a glut in the market for Cheddar cheese, as a broker had some to place as low as 1s. 1d. lb. during this week. Commercial news is exceptionally scarce this week, as the strike news overshadows other topics. The property market is expected to decline, on account of the extraordinary Municipal budget that has to be tackled shortly. It certainly is a war budget, with an increase of £100,000 to £200,000 in one fell swoop.

An executive meeting of the Federation passed the following resolution unanimously: "That this Executive Committee asks the Government to appoint a Commission to investigate the circumstances of the recent Municipal strike and apportion the blame to the body or bodies responsible, the Federation, the Amalgamated Society of Engineers, and the Town Council to be permitted to appoint representatives to examine the witnesses." This has created a better impression in commercial circles.

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**BRICKS, CEMENT, LIME, ETC.**—Pretoria Portland Cement, 9s. 3d. bag; 8s. 3d. truck loads; lime, white, unslaked, 7s. 6d.; truck loads, 6s. 6d.; slaked, do., 5s. 6d.; blue, 4s. 6d.; plaster lime, 5s. 6d.; bricks, stock, delivered, 65s. to 70s.; wire cuts, 70s. to 80s.; pressed, 70s. to 80s. 1,000; road transport expensive when obtainable; salt glazed, £15 15s., and white bricks, £35 per 1,000; roofing tiles, £17 10s. to £27 10s. per 1,000; glazed tiles, 7s. 6d. to 7s. 6d. per yard; paving cement tiles, 8s. 6d. per yard laid; reinforced concrete columns, 6ft. plain, 25s.; fluted, 30s.; fireclay bricks, £8 10s. to £10 at kiln, per 1,000; clay chimney pots, 45s. to 70s., according to height, 12in. to 18in. per dozen.

**OILS, PAINTS, LEAD, OXIDE, GLASS.**—Linseed, raw and boiled, 13s. 3d. to 14s. O.M. gall.; white lead, 1s. 6d. per lb. and 1s. 3d. in big lots; turpentine, 66s. 2/4 1.5 galls.; 10/ 5-8 imp. tins, 72s.; oxide in oil, 60s. per 100 lb.; dry oxide, 13s. 6d. to 14s.; linseed oil putty, 9d. per lb.; mastic in tins, 1s. 6d. lb.; British plate glass, ½ in., 6s. 6d.; do., mirror, 7s. 9d.; window, 16 oz., 1s. to 1s. 6d. per foot; and fancy glass, 2s. per foot.

**GREASE.**—Imported, A.F. axle, £35 4 local, £27 4 to £28 per ton; tallow (local), 8d. per lb.; White Rose paraffin, 20s. 4d. 2/4 Local paraffin, 20s. 1d.; petrol, 35s. 6d. to 43s. 6d. 2/4 I.M.P.; motor oil, 7s. to 7s. 6d. per gallon; engine lubricating oils, 37s. 6d. to 45s. per case; cylinder, 37s. 6d. to 45s.

**CHEMICALS.**—Mercury, £40 75lb.; bichromate potash, 5s. 6d. lb.; chlorate, 4s. 6d. lb.; permanganate, 11s. 6d. to 13s. lb.; alum, 6d. lb.; carbolic acid, 7s. 6d. lb.; borax, 115s. 100lb.; cyanide sodium, 2s. 3d. to 2s. 6d. per lb.; hypos, 9d. lb.; nitrate lead, local 50s. 100lb.; litharge (heavy), 70s. to 72s. 6d. (commercial), 58s. 6d. 100 lbs.; zinc sheets and blocks, 1s. 9d. lb.; locally-smelted zinc, 61d. lb.; plumbago crucibles, 5d. to 6d. per number; carbide, 105s. to 120s. 100lb.

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**IRON & STEEL.**—Imn., ½ in. and ¾ in. rd., 9d. to 1s. lb.; ½ in. rd. and square 70s. to 75s. 100lb.; ¾ in., 68s.; ¾ in. round, 60s. to 65s. 100lb.; 1 in. op. round, 36s. to 40s. 100lb.; square iron, 36s. and up, 100lb.; flat iron, small chasing sizes, 40s. to 70s.; flat, average width and thickness, 27s. 6d. to 60s.; round iron, local ½ in. upwards, 33s. 6d. per 100lb.; square iron, local ½ in. upwards, 33s. 6d. per 100lb.; flat iron, average width and thickness, 33s. 6d.; mild steel bar, 61d. to 9d. per lb.; drill, 10d. to 1s. per lb.; steel plates, 75s. to 85s.; many sizes unobtainable; hexagon and cuphead bolts, ½ in. diameter, 2s.

per lb.; 5-16in. diameter, 1s. 9d. per lb.; ¾ in. diameter up to 3in. long, 1s. 9d. lb.; ¾ in. dia., 1s. 6d. ¾ in. and up long 1s. 6d. lb.; ¾ in. dia. up to 2½ in. long, 77s. 6d. 100lb.; ¾ in. dia. and 2½ in. up long, 75s. per 100lb.; ¾ in. diameter up to 2½ in. long, 85s. per 100lb.; ¾ in. dia. 2½ in. and up long, 60s. per 100lb.; ¾ in. diameter, 2½ in. and up long, 55s. 100 lb.; ¾ in. and 1 in. diameter, same price as ¾ in. diameter; nuts, ½ in., 1s. 3d. per lb.; ¾ in., 85s.; ¾ in. 95s.; 1½ in. and 1½ in., 85s.; 1½ in. to 1½ in., 87s. 6d.; 2 in. up, 92s. 6d.; washers, all 45s.; rivets, 3-16in., 1s. 6d. lb.; ¾ in., 5-16in., 1s. 6d. lb.; 7-16in., ¾ in., 1s. 3d. lb.; ¾ in., 75s.; ¾ in., 65s.; ¾ in. up, 60s. 100 lb.; shoes and dies, 32s. 6d. to 35s., 100lb.; rails, £25 per ton; picks, 4lb., 40s. doz.; shovels, 70s. to 75s. doz.; drill hammers, 5½d. to 6d. per lb.; hammer handles (best American), 14in., 4s. 6d.; 24in., 10s.; 30in., 14s.; 36in., 16s. 6d. per dozen; metal, anti-friction knoxite, 11d. to 4s. and special prices per lb.

In consequence of the daily, and even hourly, variation in prices, the Editor will answer reply-paid telegrams to verify any quotation in our list.

## Zaaipiaats Tin.

The Zaaipiaats Tin results for the month of April, 1918, are as follows: Days run, 26 days; concentrates won, 50 long tons; estimated profit for the month, excluding Government taxes and directors' fees, £7,681 5s.; capital expenditure, nil.

## A Self-Locked Detachable Bit.

The self-locked detachable bit, as advertised in another column, should be of interest to the mining industry, especially the deep levels and low-grade mines, as it would mean a great saving in drill steel and transport labour. It is claimed by the inventor to be practical and efficient and suitable for all types of rock-drilling machines. The important features are that it gives solid faced bits to hollow steel shanks, can be made at a low cost, re-sharpened several times by hand or machine.

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## RATING OF SITE VALUES.

### Mining Company Loses Appeal.

The considered judgment of Mr. Justice Gregorowski in the matter of the Kleinfontein Estates and Township, Limited, v. Benoni Valuation Court, was read this week in the Transvaal Provincial Division of the Supreme Court. It was a stated case submitted for the decision of the Supreme Court under Section 13 of the Local Authorities Rating Ordinance (No. 6 of 1912, as amended by Ordinances 1 of 1916 and 4 of 1917). The company (said his Lordship) owned landed property in the municipal area of Benoni, consisting of 2,209 morgen of the freehold portion of the farm Kleinfontein, part of which it used as a dam for the conservation of water. It had spent £33,616 on the erection of the dam, sold water to neighbouring mining companies and derived thereby an annual revenue of £12,586. Another portion was divided into lots sold for industrial stands. The residue was not used by the company, but it derived from it an annual revenue of £100 for the grazing of cattle. In March, 1917, the respondent valued the land for rating purposes as follows: Agricultural land site value, £61,066; improvements, £33,616; homesteads and other buildings, £2,330; total, £97,612. The company objected that the site value was excessive, and had been computed on the wrong basis. The dispute, continued his Lordship, turned on the value of the dam and the way in which the dam affected the site value. The valuer (whose figures were not disputed) put the farm as an agricultural proposition at £5 per morgen, but he added that portion of the farm had an excess value owing to its adaptability to conserve water and to yield a large revenue by expenditure of capital. He then capitalised the annual revenue, took into consideration such factors as the life of the surrounding mines which paid for the water, the extension of the East Rand, etc., deducted the capital outlay, with allowances for interest, sinking fund, etc., and thus arrived at an excess value of £45,046, which, according to him, represented the site value of the dam as an excess over the agricultural value. The appellant objected that this procedure was not in terms of the Ordinance, which directed that the site value of land should mean "the capital sum which the land might be expected to realise if offered for sale on such reasonable terms and conditions as a bona-fide seller would require, assuming that the improvements (if any) thereon or appertaining thereto had not been made." His Lordship referred in detail

to the provisions of the Ordinance, and to various Australian decisions in regard to similar enactments in Australia, and came to the conclusion that the object of the Legislature was that a property should be assessed at its fair market value, but it wished to throw a heavier liability on the site value, and to relieve improvements, the result of human operation or work, as much as possible. But there was nothing to indicate that it intended that the value should be anything else than the true marketable value, though it had to be distributed between "site value" and "improvements" on the principles stated in the respective definitions. The case must therefore be answered in favour of the respondent's contention, appellant to pay costs. The Judge-President and Mr. Justice Curlewis concurred.

In the course of its enquiry, the Select Committee on Railways and Harbours took evidence on the subject of the agreement between the Government and the Union Steel Corporation in so far as it affects the interests of the Railways and Harbours Administration. Though not within the scope of its reference, yet in view of the importance of the development of the iron ores of the country, the Committee call special attention to the provisions of the clause in the agreement dealing with this subject. The development of iron ores is receiving the attention of the Union Steel Corporation and to this end the Corporation hope to produce 300 tons of pig iron from local ores early in 1918. If the process, which is in the nature of an experiment, is successful, it is confidently hoped to supply the whole of South Africa's requirements in pig iron in a comparatively short period thereafter.

### Union Iron Ores.



## Engineering Notes and News.

### S.A. INSTITUTE OF ELECTRICAL ENGINEERS: PRESIDENT'S ADDRESS.\*—VII.

It is in the base metal industries that we must look for the permanent development of the country. The recommendations in Mr. Kotzé's memorandum on an iron and steel industry, dated 8th March, 1909, presented to both Houses of the Transvaal Parliament have at last been brought to the light of day owing to the exigencies of the war, more especially Mr. Kotzé's suggestions with regard to the introduction of electrical furnaces for scrap iron, etc. It is a source of satisfaction to this Institute to know that one of our recent Past Presidents (Prof. W. Buchanan) was responsible for the design and installation of the first electric steel melting furnace in South Africa, and we congratulate him on his skill, adaptability and originality in making it a practical success at a time when standard apparatus was not obtainable, and the best had to be made of what was available to him in the form of obsolete machinery and apparatus. His knowledge as an expert designer was a powerful factor in conjunction with the efforts of Prof. Stanley, and the members of the Shoes and Dies Committee, in the successful introduction of a new local industry. It is satisfactory to know that as a result of this successful innovation, the Union Steel Corporation of Vereeniging is embarking on a much larger scheme with electric furnaces for producing, from scrap, practically all the shoes and dies required by the mining industry. More important than anything else, perhaps, is the announcement of the fact that the Transvaal Blast Furnace Co., Ltd., was recently registered with a capital of £25,000 for the purpose of putting the iron ores and fluxes of the Transvaal to practical test in the making of pig iron leading up to the manufacture of steel. In Pretoria there is at last an early start to be made in the iron industry by the Pretoria Iron Mines, Ltd., and it is expected by the middle of the year that, from their first blast furnace, 15 tons of pig iron will be made per day. It is understood that the necessary coke will be supplied from the Dundee Coal Co., Ltd., in Natal, through the simple beehive coking arrangement in the first instance, but it is intended to erect as early as possible a series of Coppée waste-heat by-product ovens to recover tar, sulphate of ammonia and benzol. It is difficult to forecast the enormous importance of these innovations. Apart from the great possibilities the future has in store with regard to the local manufacture of machinery and plant of iron and steel imported at present to this country to the value of several millions per annum for the mines and railways, as pointed out in the reports of the Dominions Royal Commission, manufacturers in Great Britain may be induced to consider the possibility of working blast furnaces in this country and exporting the pig iron produced. The blast furnace industry will also have a very beneficial effect on the coal industry in finding a large field for the consumption of coke, leaving a vast field open for the recovery of the by-products of coal tar, etc., and as pointed out by Prof. Stanley in the *Journal of Industries*, December, 1917, the necessity for producing charcoal in large quantities in connection with other sections of the iron industry will provide an economical means of dealing with the 200,000 tons of timber at present wasted annually in the wattle bark industry, and at the same time valuable by-products will also be obtained from the distillation of the wood by the use of suitable methods introducing yet another large industry in itself. Referring briefly to the other base metals, already the Zaaiploots Tin Mining Co., Ltd., has successfully embarked on a new industry and has brought tin smelting to a commercial stage and is to-day producing metallic tin of high quality to take the place of the imported

article. As large amounts of copper are exported from Rhodesia and the Transvaal, it is hoped that in the near future endeavours will be made in the direction of copper smelting and the electrolytic refining of copper. Ample opportunities exist for the inception of a copper manufacturing industry in South Africa, as there are large quantities of bare copper used for overhead wires, bus-bars, etc., in connection with the electrical industry, and there are innumerable uses for copper sheets and tubes. In this connection engineers at the big power stations might offer specially low prices for power at times of low load. The very large output of copper at Katanga in the Belgian Congo expected shortly to reach the high figure of 100,000 tons per annum, and the relative proximity to the enormous water power at the Victoria Falls in Rhodesia if properly harnessed might make South Africa the greatest producer of electrolytic copper in the world; and seeing that most of the raw materials are practically on the spot, we may yet realise the birth of large cable manufacturing industries. The presence of zinc and lead deposits in the Transvaal, having regard to the imports of these metals, should likewise provide an outlet for the local treatment and refining of these metals. It is hardly necessary to point out that with tin, zinc, copper and lead refined in this country, it would lead to the manufacture of some of the most important alloys used in engineering. There must be a large number of secondary cells used in South Africa in connection with power plants, automobiles, and train lighting, and the local manufacture of accumulators with lead elements is also a possibility, and eventually the manufacture of electric vehicles would follow in its train. In connection with this matter it has occurred to the writer that in any case the high cost of electric vehicles could be appreciably reduced if the bodies and other parts were made locally, simply importing the essential parts which cannot at present be economically made in South Africa. The high cost of petrol and the relatively cheap cost of electric power are such that there is undoubtedly a great future for the electrical vehicle if its initial cost can be appreciably reduced. We look to importers, generally, in pushing their goods to assist the local manufacture of parts of their machinery wherever this is possible; this is a policy, which I understand, is largely being carried out in Japan and other countries. Tram-car bodies and wagons are being made successfully in South Africa, why not motor-car bodies? With regard to the future of South African timber, the municipal engineers of the country might with advantage follow the excellent example of Mr. Jamieson, the Town Engineer of Pretoria who, after pointing out that roughly £1,400,000 is spent annually upon imported timbers, has recommended his Council to embark upon a systematic policy of afforestation in town lands, and secure a more general use of indigenous and exotic timbers in South Africa. Where money can be put aside for a few years, as is the case with municipal bodies, the proposition, according to Mr. Jamieson, is a highly profitable one. Now that the quality of South African cement is an established fact, it has opened a large field for the making of structures of reinforced concrete, such as bridges, standards, water tanks and such like, and in the use of local materials. Large concrete pipe work, said to stand pressures as high as 400 lbs. per sq. inch, is being made with the Hume Pipe process. It has been estimated that 100,000 tons of steel and cast iron piping are on order for South Africa with little hope of getting delivery until after the war. This fact alone should stimulate a big industry in concrete pipe work made from local products. The subjects of electro-culture, hail-

\* Address by Professor Dobson, President of the S.A.I. of E.E.

storms, electric rain production, and the fixation of atmospheric nitrogen by electric power are also matters of interest to the electrical engineer. The destructive effects of hailstorms in connection with the South African fruit industry are well known, and in many countries, particularly France, great importance is attached to the effectiveness of a carefully arranged system of lightning conductors in warding off hailstorms and eliminating damage to crops, etc. There are grave differences of opinion amongst scientists and meteorologists as to whether these lightning conductors are really effective in preventing hailstorms. Considering that it would be of value to the country to have the best available information on this subject, Mr. Innes, the Government Astronomer, who is very sceptical as to the value of lightning conductors "Niagaras," has kindly consented to read a paper before this Institute, during the course of this year, on the formation of hailstorms and the opinions of meteorologists as to the protection of "Niagaras." Any account of progress in industrial development and future possibilities would be of little value without a reference to some of the labour problems which bristle with difficulties in this country. The so-called "poor white" problem still causes great anxiety, but Major Naude, the Superintendent of White Labour and his staff are doing excellent work through the medium of the "White Labour Bureaux" in finding suitable employment on the land. The number of poor and unemployed whites is estimated at no less than 108,000, and it has been estimated that a sum of over £200,000 per annum is spent on relief. This is a very serious position, and may be said to be due to the incompleteness of State organisation in the pioneer stages of its development. Consequently they will have to be looked after, wherever necessary, by State employment in road making, irrigation work, and railway extensions and such like. The degradation of the white population, owing to the presence of the natives and the coloured races, must be stopped at all costs, and the making of poor whites must be made impossible in the future by compulsory education. The system of education in the Transvaal is praiseworthy, but owing to the long distances to some of the farms from educational facilities, there is still the danger that many children are not receiving the kind of education which will lift them above the coloured races. In many cases free boarding schools with all expenses covered by the State will be a more profitable proposition eventually for many children belonging to impecunious people engaged in farming rather than they should be rendered useless as future wage earners. Owing to the lack of suitable educational facilities a very close watch by the Government must be kept on children whose homes are outside the three-mile compulsory limit as a possible source of educational neglect, and every child in the country should receive at least a compulsory primary education. I understand the Government will now provide a school and teaching staff whenever there is a minimum of 15 children in one district. The practical aspect which appears to one, however, is that the standard of education given under such circumstances is necessarily low, and in the opinion of the writer it would be far better to send such children to boarding schools, free of cost, where they would not only receive a better education, but would be brought more into touch with civilisation. In connection with the chief industrial occupations in the country, the great upheaval of economic conditions has been met with a fair amount of give and take on the part of employers and employed, and conciliatory methods have so far been the order of the day, thanks to wise counsel on the part of both Capital and Labour and the settling of disputes at round-table conferences at which both sides have been adequately represented. The competition of the coloured and native races in the skilled trades still remains one of the burning questions in South African Industrialism. There is open competition on the part of the coloured races in almost all places in the Union except the Transvaal, which at present remains in the domain of the white worker by what is called the coloured bar, and ever since the Act of Union this matter has become increasingly difficult. This constitutes very good reason why the training of the whites should be of the highest order, and I sympathise with those educa-

tional authorities who are advocating compulsory education in the case of whites up to the age of eighteen, in order to place the white man at an advantage beyond all doubt. The gradual progress of the coloured and native races is certain as night follows day, as there is every facility being offered in the way of education, and no one will deny that that is right; but a full recognition of this is necessary in the white man's interest, so that suitable training and educational facilities are provided for each, and the pre-eminence of the white man's predominance rigidly maintained. In this connection I desire to briefly refer to the apprenticeship of white youths to the skilled trades. Speaking from an experience of having served an engineering apprenticeship of seven years myself and with all my experience in South Africa, spread over many years in connection with training of apprentices in various workshops, I have formed the opinion that having regard to South African conditions the best method to adopt in the training of white youths is to spend the first two years at a Trades School and so obtain a thorough knowledge of the principles of the trade which it is elected to follow, after which a further three years should be spent in the ordinary workshops, working in conjunction with skilled artisans to complete the apprenticeship. This brings me to a very important point with regard to the youths of the country who have been fighting for the Allied cause. Some of them are already spending their fourth year in war service, and the nucleus of apprenticeship training has been lost to them. What is the position to be adopted when these young men return from the front? Surely they are not to be left in the world without some means of qualifying themselves for some training in order that they may face the competition of the other races in South Africa. It is important that the public bodies of the country should take up this question immediately. There is finally the question of the native himself. In a most instructive paper on "Native Education from an Economic Point of View," printed in the 1917 September *Journal of the South African Association for the Advancement of Science*, the Rev. Noel Roberts, after taking consideration of the total population of the Union and available statistics with regard to native employment, draws the conclusion that there are one and three-quarter million male natives practically unemployed in the Union. I agreed that they possess wonderful gifts in the management of animals, and if properly trained should prove to be successful breeders of cattle, and if directed into proper channels the export of beef, mutton, hides and wool, cotton, tobacco, etc., might be increased a hundredfold. An investigation into the varied industries of Ceylon, Burmah, Malay States, China and Japan by the Government would be of great value, and a start made in copying such inquiries for native employment in this country. In the words of Mr. Roberts: "What an enormous difference it would make if the latent energy of the unemployed natives were converted into productive power." In the opinion of the writer, the labour problems here are so complex that the work of the Industries Advisory Board and the Science and Technical Committee in connection with the Industrial Development of South Africa must be closely followed by a thoroughly competent and live body, specially appointed by the Government, to investigate and consider the intricate problems of South African labour forces, and to recommend the best procedure to be adopted to find economic employment for a largely increased white population, and to utilise the enormous latent productive power of unemployed natives to profitable account.

#### CONCLUDING REMARKS.

After endeavouring to trace some of the important changes in industrial development arising out of the changes it will be obvious that South Africa, in common with other countries, has made wonderful progress in utilising resources and adding to the value of its raw material. There are, indeed, great opportunities for the future, much remains to be done, and every endeavour must be made to retain the trade that has been secured by exceptional circumstances. Mr. Burton, the Union Minister of Finance, has said: "There are only two obstacles to



realisation of a bright future for South Africa, one is the paucity of the white population, which would right itself, the other is the blighting and decimating influence of racial and sectional factions." The accomplishments of the South African Brigades in South-West and East Africa as well as in Europe, where Dutch and British have fought side by side in the Allied cause, have done more than anything else to wipe out the blighting influences of racialism. There need be no fear in the future of the so-called sectional or party influences so long as the Government continues its progressive policy in the best interests of the country. In this sense the Government should realise that large capital will have to be available for many of the future industries, and if necessary the Cabinet must provide capital for the most important industries, in which there is no doubt they will prove valuable national assets, and in other cases render assistance by means of protective tariffs, bounties, etc. It

is essential that no time be lost between now and the termination of the war in carrying out a programme of this description as therein lies South Africa's great opportunity. The financial position of the country is sound, having regard to the ratio of the National Debt and the Revenue of the Union, owing to the productiveness of most of the Public Works; consequently there is no reason why immediate steps should not be taken in connection with some of the schemes already reported upon by the Industries Advisory Board and the Scientific and Technical Committee, which will result in ever decreasing imports and increasingly large exports, thus creating a permanently flourishing condition of the country at an early date, so that it may be said of South Africa, as Horatio Bottomley has written of Great Britain: "*Never was there in the story of the Ages such a wonderful awakening and so mighty an avalanche of endeavour.*"

## OVERWINDING AND CONTROLLING DEVICES FOR WINDING-ENGINES.

In discussing the paper by Mr. H. Newbery, read recently before the South African Institute of Electrical Engineers, Mr. E. V. Perrow said: Mr. Newbery's paper brings to our notice one of the most important points in connection with electric hoisting on these fields: I might say of all hoisting, "The Safety First Aspect." It is hoped that this paper will be thoroughly discussed by our members, and as the author and Mr. Dew have said, it would be instructive if descriptions of the various devices in use which are intended to minimise the risk of accident were brought forward for discussion. In the first place, it appears to me, from the author's description and diagram, that he has eliminated the "Call Bell" system in the shaft where his apparatus was installed. If this is so, I fail to see how the system can comply with Regulation 29 under the Mines and Works Act. If such is not the case and a "Call Bell" also is used, the running of an additional wire right through the shaft is necessary, and the cost of this in a deep level mine would probably be prohibitive. It is not essential, nor is it, I think, usual, under local hoisting conditions, for the engine-driver to reply to the skipman's signals for the hoisting of rock. He receives the 1 bell signal for raise and immediately starts hoisting; but, when hoisting men, the driver first receives 3 bells, to which he must reply. Bearing this point in mind, I would like to describe to members an arrangement suggested by my father some years ago, by which the overwinding prevention device or limit switch in the headgear for men could be controlled. The ordinary 3-wire bell system would be used, but before the driver could reply to any signals for hoisting men, he would have to put in a plug in the battery wire to his pull. This plug would carry an arm, which, when in the "on" position, opens the contacts "C" controlling the men limit switch, and thus permits it to operate and trip the main switch should an overwind occur. The plug is withdrawn when rock hoisting is to take place, closing the contacts and thus permitting the rock limit switch only to come into operation. The connections for this arrangement are shown by the dotted lines in the figure. Thinking over this matter after reading Mr. Newbery's paper, it occurred to me that this arrangement might be adapted to work a relay, which, in addition to open-circuiting the men limit switch could operate a "men" sign, as proposed by the author. The connections for this are shown in full lines in the figure. By these methods, the installation of an additional wire in the shaft is obviated without sacrificing the safety of the arrangement. Should the driver make the mistake of leaving his plug in when hoisting rock, his "men" sign would show and when running past the men limit switch his main switch would trip before the skip entered the tip. It will easily be seen that by making the battery wire, which is led through the plug, also feed the driver's pull for the surface bells, the relay would be operated when signals are being replied to, to either the banksman or the skipman. Trip switches, when placed in the headgear, should be of such

a design that both the skip and the cage will operate them, for it frequently occurs that men are hoisted in both. As pointed out by other members, it certainly is not desirable that safety devices should be operated from the indicator gear. On some hoists a special screw is fitted to work any overwinding or safety devices that may be used, but it appears to me that for normal purposes a device such as the Phillip's could be satisfactorily worked from the headgear by having a switch so located that the up-coming skip would close it and allow it to remain closed until the skip on its downward trip opened it. It would naturally have to be set to allow of the skip travelling at least from bank to tip for both man and rock service. Limit switches for use in headgears, etc., have severe service to perform, and it would be interesting if we could have described some of those that are proving suitable and are in satisfactory use to-day.

### New Patents.

712. William Martinus Tichy.—An apparatus for use at Railway level crossings (on single lines of rail) to prevent accidents, by giving due warning of approaching trains.
713. William Martinus Tichy.—An apparatus for use at railway level crossings (on double lines of rail) to prevent accidents by giving due warning of approaching trains.
714. Harry Sidney Dix, John Thomas Pryor and Clifford Coffey.—An excess speed alarm for tram cars and other vehicles.
715. Frederick Wilfred Scott Stokes.—Improvements in or relating to rollers for sluice gates and the like.
716. Harrison William Rogers.—Synchronising mechanism for motion picture and sound reproducing means.
717. George Hay Dale.—Improvements in or relating to tents.
718. Joseph Bernhardt Eder and British Agencies, Ltd.—Improvements in mine and like electric bells.
719. William Oddy.—An improved method of fastening certain parts of bedsteads.
720. Emanuel Cervenka.—Process of photography in colours.
721. Abel French Spawen.—Improvements in drying chambers.
722. Harry Clifford Hilton, John James Robert Smythe and William Anderson.—Improvements in means or devices for use in the ventilation of mines.
723. Henry Frederick Hampson.—A sparking plug tester.
724. Henry Frederick Hampson.—Improvements relating to foot cycles.
725. James Edward Anderson.—Improvements in steam superheaters.
726. Thomas Cooper.—Improvements in friction clutches.
727. Sidney Davis Lane.—Improvements in or relating to corrugated or like packing material.
728. Henry Alexander Stenning and James Hamilton Stirling.—Improvements in and relating to superheaters, especially applicable to locomotives.
729. James Simpson & Co.—Improvements in and relating to valves for distributing steam or other fluid in pumping and other engines.
730. Vincent Lichfield Raven.—Improvements relating to the cylinders of locomotives.
731. British United Shoe Machinery (South Africa), Ltd.—Improvements in or relating to lasting machines and controlling mechanism particularly applicable thereto.

# Lace Proprietary Mines, Ltd.

(Incorporated in the Transvaal.)

## NOTICE OF SPECIAL GENERAL MEETINGS

NOTICE IS HEREBY GIVEN that a Special General Meeting of the Members of LACE PROPRIETARY MINES, LIMITED, will be held at the Board Room, The Jeppe Arcade, Commissioner Street, Johannesburg, on Tuesday, the 6th day of August, 1918, at 10 o'clock in the forenoon, for the purposes of passing the following Resolutions, with or without modification:—

- (1) That a certain Provisional Agreement (hereinafter called the said Agreement) made the 14th day of May, 1918, between the Company and Messrs. Van Hulsteyn, Feltham and Ford, Solicitors of Johannesburg, acting for and on behalf of undisclosed principals, for the reconstruction of the Company in the manner shown in the following Resolutions, be and is hereby confirmed, and the Directors are hereby authorised to do all things necessary to complete the said Agreement and to carry the same into effect.
- (2) That the Capital of the Company be and is hereby reduced from the sum of £300,000 in Shares of £1 each to £127,500 in Shares of £1 each, and that such reduction be effected by cancelling the 45,000 Reserved Shares of the Company of £1 each, and by calling in and cancelling all the 255,000 Shares of £1 each of the Company which have been issued, and by issuing in place thereof to the Shareholders of the Company 127,500 Shares of £1 each in the Reduced Capital of the Company, to be distributed among the Shareholders in such manner that each Shareholder shall receive One Share of £1 in the reduced Capital for every Two Shares in the present existing Capital of the Company registered in his name as on the 1st day of August, 1918, and surrendered to the Company.
- (3) That the Chairman of the Company for the time being is hereby authorised to apply to a Competent Court for confirmation of the aforesaid reduction of Capital, and to do all things necessary to make the said reduction effective.
- (4) That Article 39 of the Articles of Association of the Company be and is hereby amended by adding thereto the following words:—

"(a) The Directors of the Company may and shall forthwith, if and when the reduction of the Capital of the Company to £127,500 resolved upon by a Special Resolution of the Company confirmed as such on the 28th August, 1918, shall have become effective, increase such reduced Capital of the Company of £127,500 consisting of 127,500 Shares of £1 each to £255,000 consisting of 255,000 Shares of £1 each by the creation of 127,500 new Shares of £1, which new Shares shall forthwith on the creation thereof be offered for subscription at par by the Shareholders of the Company registered as such on the 1st day of August, 1918, proportionately to their registered holdings, and such offer shall remain open for a period of three months from the date upon which the aforesaid reduction became effective, and the Directors may and shall allot and issue so many of such shares as may be applied and paid for by the Shareholders in terms of such offer to such Shareholders respectively who may so apply and pay for the same, and may and shall allot and issue all of such shares which shall not be applied and paid for by the Shareholders to Messrs. Van Hulsteyn, Feltham and Ford, and/or their nominees, and assigns, against payment of £1 for each of such Shares."

"(b) And the Directors may and shall, within a period of twelve months after the date upon which the aforesaid reduction became effective, further increase the Capital of the Company from £255,000 consisting of 255,000 Shares of £1 each to £382,500 consisting of 382,500 Shares of £1 each by creating a further 127,500 new Shares of £1 each, which new Shares shall forthwith on the creation thereof be offered for subscription at the price of twenty-two shillings and sixpence each by the Shareholders of the Company registered as such on a date to be fixed by the Directors proportionately to their registered holdings on the date so fixed, and such offer shall remain open for such period as the Directors may determine, and the Directors may and shall allot and issue so

many of such Shares as may be applied and paid for by the shareholders in terms of such offer to such Shareholders respectively who may so apply and pay for the same, and may and shall allot and issue all of such Shares which shall not be so applied and paid for by the Shareholders of Messrs. Van Hulsteyn, Feltham and Ford, and/or their nominees and assigns, against payment of the sum of Twenty-two Shillings and Sixpence for each of such shares."

"(c) And the Directors may within a period of five years and seven months after the date upon which the aforesaid reduction became effective, further increase the Capital of the Company from time to time by the creation of Shares of £1 each not exceeding in the aggregate 1,117,500, but such last-mentioned power shall only be used by the Directors for the purposes of satisfying the exercises of the options granted to the principals of Messrs. Van Hulsteyn, Feltham and Ford under the terms of the Agreement of the 14th day of May, 1918, which was ratified by a Special Resolution of the Shareholders of the Company confirmed as such on the 28th day of August, 1918, or for the purpose of disposing of such Shares in terms of the said Agreement, and the Directors may after creation of such Shares, or any of them, allot and issue the same to such persons and on such terms as are contemplated in the said Agreement."

AND NOTICE IS HEREBY FURTHER GIVEN that a further Special General Meeting of the Company will be held at the same place and hour, on Wednesday, the 28th day of August, 1918, for the purpose of receiving a Report of the Proceedings of the first-mentioned Meeting and of confirming, if thought fit, all or any of the aforesaid Resolutions as Special Resolutions.

The Agreement mentioned in the first Resolution may be inspected by Shareholders at the Offices of the Company, The Jeppe Arcade, Commissioner Street, Johannesburg, during business hours on all business days, between the date of this Notice and the date of the second Meeting.

The Agreement provides that the subscriptions of the Increases of Capital under Resolutions 4 (a) and 4 (b) are guaranteed at the prices at which the Shares therein mentioned are to be offered to Shareholders, in consideration for which guarantee the guarantors are granted options to subscribe for new Shares in the Company to the amounts and at the prices and for the periods following:—

- (1) 510,000 Shares at 22/6 for 3½ years from the date the reduction of Capital became effective;
- (2) 607,500 Shares at 27/6 for 5½ years from the same date.

The Company undertakes during the 5½ years not to increase its Capital beyond £1,500,000, but if the 3½ years' option is unexercised in whole or in part, the Company may deal with the Shares over which the option is unexercised.

Mr. John Dale Lace, the Chairman of the Board of Directors of the Company, is interested as one of the principals of Messrs. Van Hulsteyn, Feltham and Ford, in the said Agreement.

Shareholders may vote by Proxy, but all Proxies must be handed to the Secretary of the Company at the Registered Office of the Company, The Jeppe Arcade, Commissioner Street, Johannesburg, at least twenty-four hours before the time appointed for the Meeting at which they are to be used.

The Register of the Company will be closed from the 1st day of August to the 28th day of August, 1918, both days included.

Johannesburg, 15th day of May, 1918.

By Order of the Board,

O. F. BROTHERTON

(For the Witwatersrand Township Estate and Finance Corporation, Ltd., Secretaries).



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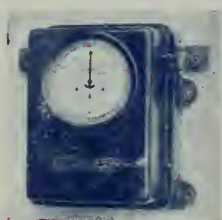
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**G.E. INSTRUMENTS**



TRAMCAR MERCURY  
TYPE WATTHOUR  
METER.

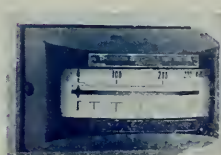


STEAM FLOW METER.

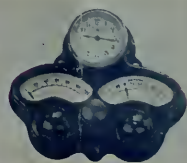
**INDICATING**



A.C. WATTHOUR  
METER.



SWITCHBOARD TYPE  
WATTMETER.



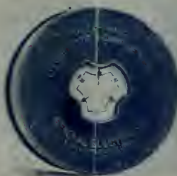
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